



# SIGNALS

LAND



SEA

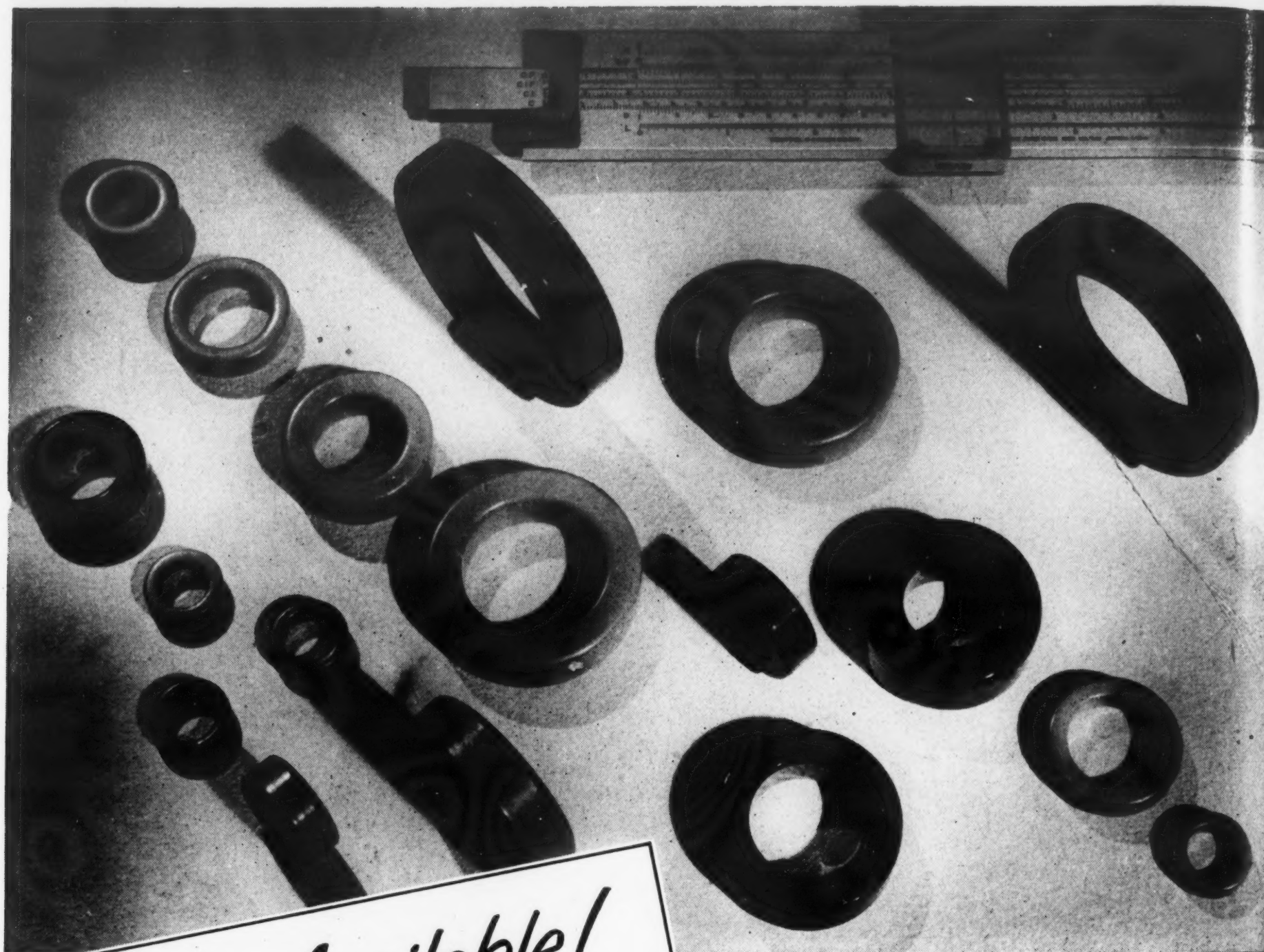


AIR

MARCH-APRIL 1950

Dr. Goubau's "G-String"





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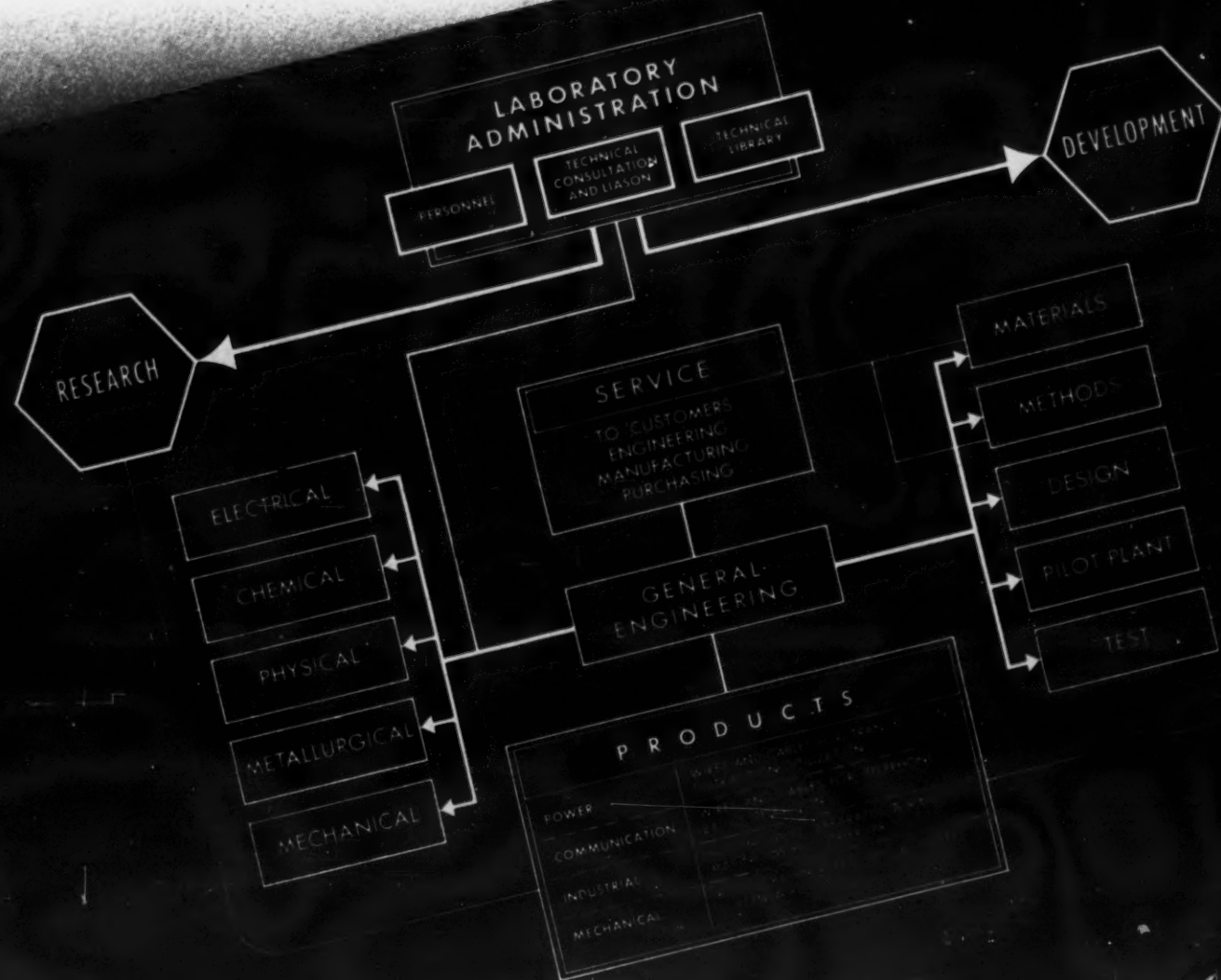


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keep our country always out in front in our sphere of product development. Substantial achievements already on record have won for General Cable an enviable reputation and—there are more to come.

## GENERAL CABLE CORPORATION



MANUFACTURERS OF BARE AND INSULATED WIRES AND CABLES FOR EVERY PURPOSE



*A page  
from the  
note-book  
of Sylvania  
Research*

## Automatic bulb sealing equipment speeds production of Sylvania Television Picture Tubes

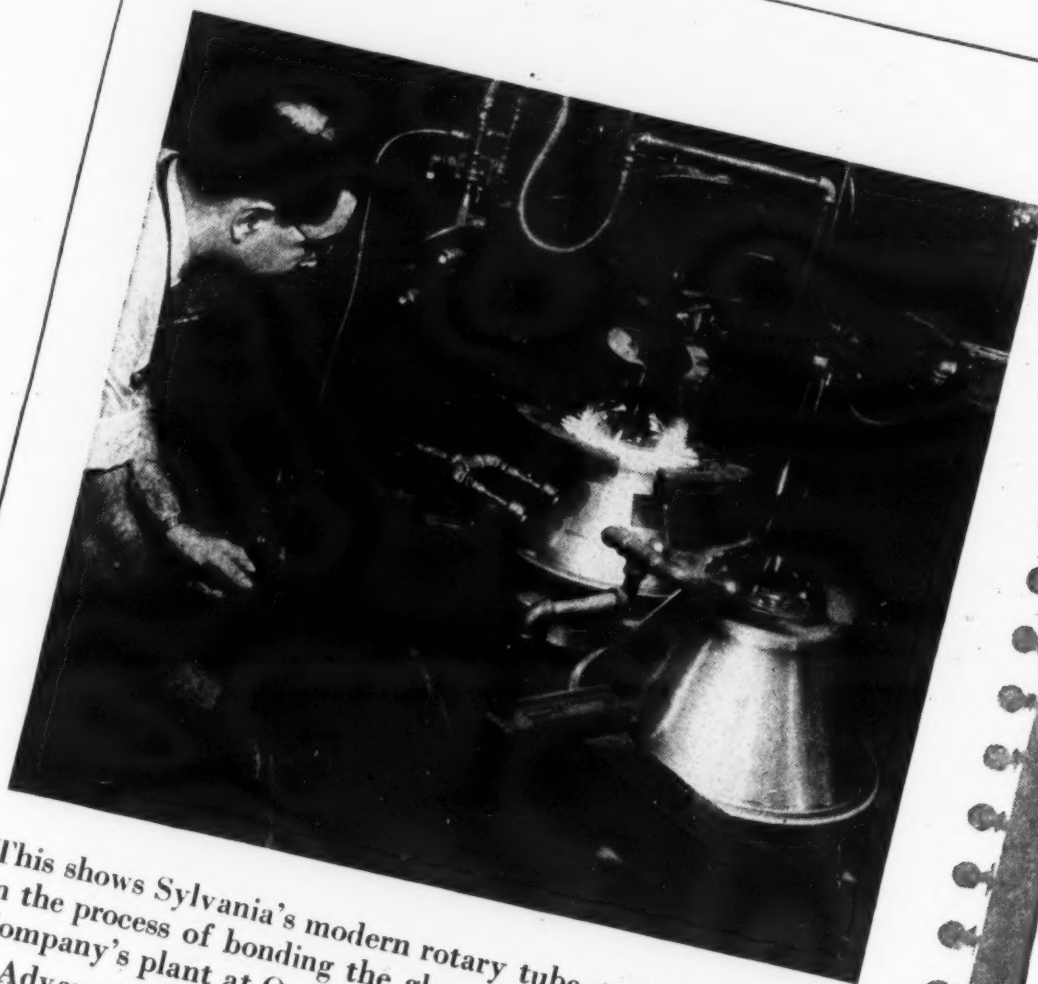
**I**t's a far cry from the slow and laborious "hand-work" methods of producing television picture tubes, to this automatic machine method now in operation at Sylvania's Ottawa, Ohio, plant.

On the machine shown here, the glass tube necks are perfectly sealed and bonded to the metal cones.

This process is but one important step in a completely conveyORIZED plant . . . where raw materials emerge as finished units. As a result of highly specialized mass production techniques and the application of the latest materials, Sylvania picture tube production increased by 30 percent during the past year.

Today, backed by continuing product research and development, plus exhaustive scientific, electrical, and mechanical tests, Sylvania is producing larger and higher quality television picture tubes . . . at lower prices.

This means better product performance for you . . . better values for television set owners everywhere.



This shows Sylvania's modern rotary tube-sealing equipment in the process of bonding the glass necks to the tubes in the Company's plant at Ottawa, Ohio. Advanced production engineering, scientific quality control, and precision fabrication of parts are factors behind the development of this automatic machine . . . a machine which is only one step in the efficient, mass production methods responsible for the manufacture of more, better and larger Sylvania television picture tubes.

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# SIGNALS



Journal of the Armed Forces Communications Association

VOLUME 4

MARCH-APRIL, 1950

NUMBER 4

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SIGNALS is published bi-monthly by the Armed Forces Communications Association at 1624 Eye St., N. W., Washington 6, D. C. Entered as second-class matter at Post Office, Washington, D. C., September 6, 1946, under Act of March 3, 1879. Additional entry at Baltimore, Md.

Subscription rates: 1 year (6 issues), \$5.00. To foreign post offices, \$6.00. Single copies, 75c plus postage. All rights reserved. Copyright 1950 by Armed Forces Communications Association. Reproduction in whole or in part prohibited except by permission of the publisher. Printed in U.S.A. by Monumental Printing Co. at Baltimore, Md.

The publisher assumes no responsibility for return of unsolicited manuscripts or art. Authors are responsible for opinions expressed in articles.

When sending change of address, please list both the old and new addresses, and allow 3 weeks for delivery of first copy.

### THE COVER

One of the most interesting of the new developments presented at the recent IRE meeting was the "G-String." Further details in the Signal Corps news section.



## From the President

Spring is in the air and in a matter of only weeks now we will be getting together for the Annual Meeting of our Association. This is the fourth national affair of this kind and from what one hears it will be a good one. It has been well publicized in SIGNALS and all of you should know by now that the time is May 12 and 13, and the place is New York City and Fort Monmouth, N. J. All of you Stateside have received postal cards informing you of the program. If you have not already sent in the reply card, dig it out now and send it to AFCA Headquarters so that we can know which of the events you plan to attend.

It is my hope that every member will come to the meeting. Reservation returns have been splendid thus far, and there are many reasons why you should be one of those present. For many of you, the distance to New York and the time and money involved may make the trip difficult to justify. But for those who can make it, I am certain that it will be well worth while.

One of the reasons for your joining the Association was to be part of a group whose members have common interests. The convention provides the opportunity for you to meet as many of your fellow members as possible. Beyond the fellowship of such an affair you, as a member, have an important duty to perform, for our Association

exists to reflect your aims and wishes. Hence, it is up to you to see that the Association fulfills this mission by taking a hand in directing its activities and letting your opinions be known. In the year round month-by-month operations of the Association we need any suggestions or criticisms you may have, and the way is open to submit these by means of letters to AFCA Headquarters and to SIGNALS, and by making your self heard at chapters meetings. Even though you may not be near enough to one of our chapters to take an active part in chapter activities, you are still important as an individual member of AFCA, and we want your views as to how our magazine can be of more interest and value to you. Right now, however, won't you please try and come to the Annual Convention and really get acquainted.

You will see at Fort Monmouth manifestation of postwar progress in communications-electronics-photography by the Signal Corps. The importance of the technical work being done here was clearly demonstrated at the recent meeting of the IRE in New York. Of the 160 technical papers presented eighteen were either the direct result of work at the Fort or represented cooperative effort between Monmouth and some other institution.

Notable among these papers was the thesis of Dr. Goubau which is being featured on the cover of this issue. All three services are making strides in research and development but for obvious

reasons only a few of the results have been made public. However, because the Signal Corps is the host at field session of the coming AFCA Annual Convention, it is the work of this group we will be viewing and hence I stress that branch's accomplishments at this time.

In connection with this year's Annual Convention, I should like to assure you that we are not deliberately following a set pattern of repeating the round of places where our annual meetings take place. Circumstances connected with the Service part of the show have thus far determined our meeting sites.

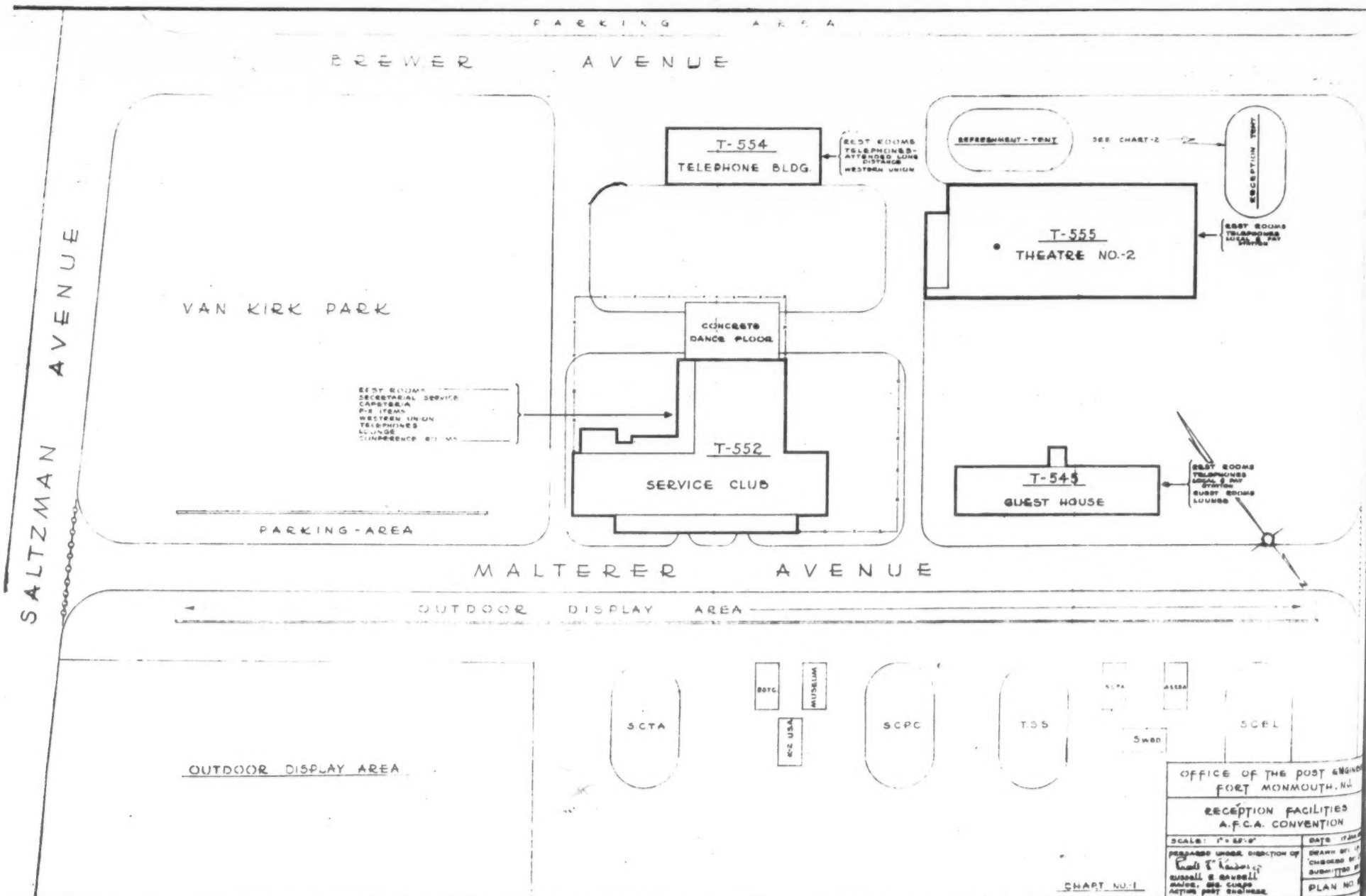
I feel hopeful that future meetings will be held in other cities so that all of our chapters may have an opportunity of playing host to the convention.

For this year, however, our attention is fixed on "Operation Lanahan" now being prepared for us at Fort Monmouth, N. J., and on the Association matters to be taken up at New York. Even the latter promises to be unusually interesting for with the expansion of the Association's activities much stimulating discussion will surely take place at the business meeting in addition to routine matters. Don't miss this. It's all going to be good.

**See you at New York and Fort Monmouth, May 12-13.**

Fredrick Chack

Chart showing Fort Monmouth reception facilities for AFCA Convention.





# 1950 AFCA NATIONAL CONVENTION

# NEW YORK CITY

# FORT MONMOUTH



◀ Getting Closer !!

Have you returned  
the post card form  
indicating whether  
you will attend?

## PROGRAM

### Friday, May 12, at New York

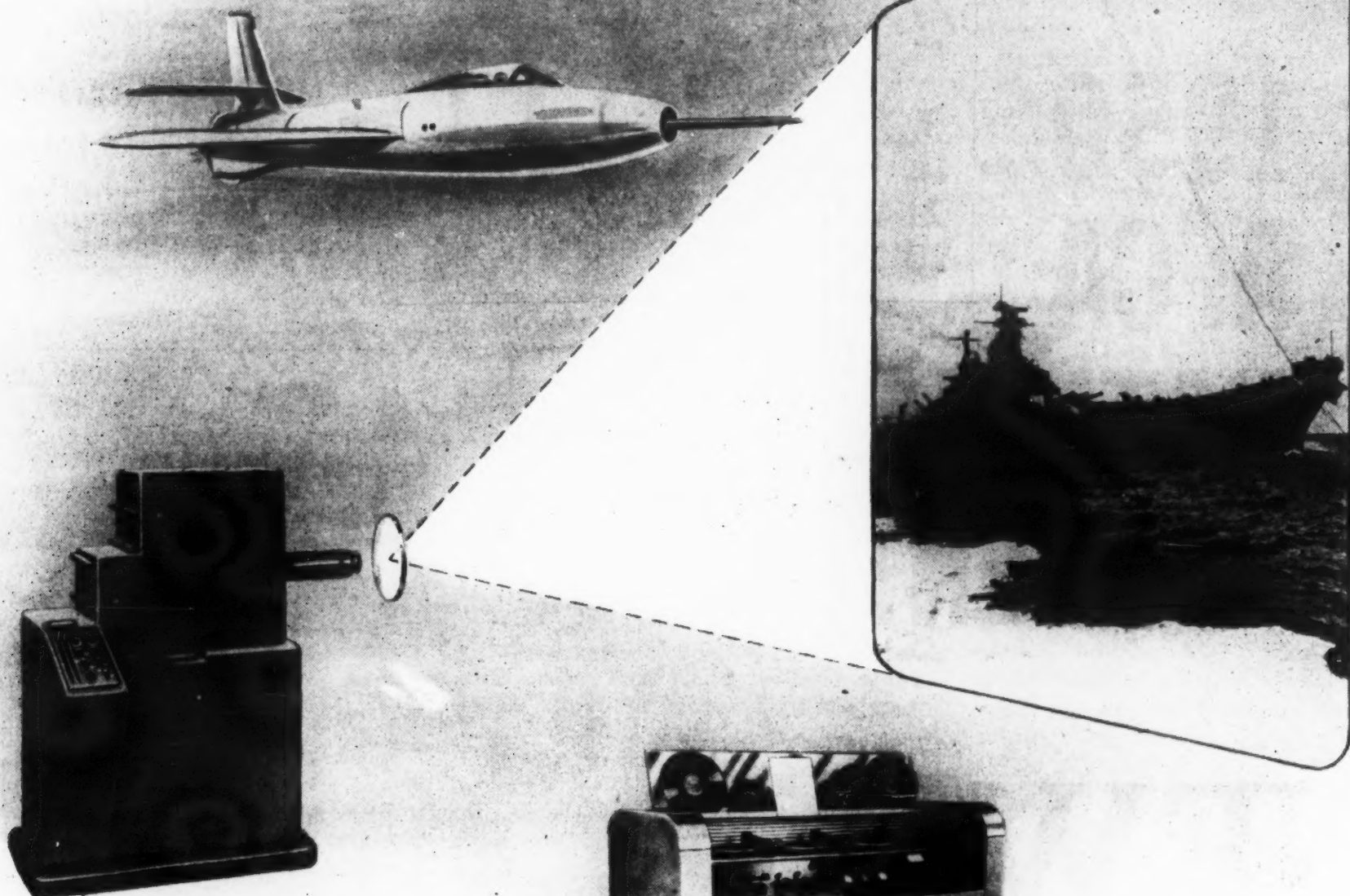
- 9:00 a.m. Registration Opens  
Hotel Commodore
- 10:00 a.m. Business Session  
to  
12:00 noon (Open to all members)
- 12:30 p.m. Dutch Treat Luncheon  
Century Room, Commodore
- 2:00 p.m. Chapter Presidents Meet  
(Open to all members)
- 2:30 p.m. Visit to SigCorps Photo Center  
(Optional)
- 5:00 p.m. Reception, Commodore
- 7:00 p.m. Banquet



### Saturday, May 13, Fort Monmouth

- 8:00 a.m. Busses leave New York for  
Fort Monmouth
- 9:30 a.m. Trip through SigCorps Eng Labs  
by television
- 12:00 noon Luncheon in open  
(Army mess)
- Afternoon SigCorps Pageant, air drops,  
troop drill, parade
- 4:30 p.m. Busses to Gibbs Hall, cocktail  
party, dinner-dance





Gray TELOP, Television Optical Projector



Gray Sound Effects Console

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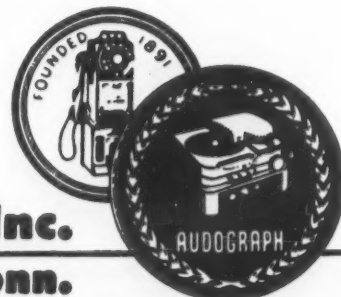
Gray offers "cleared for security" help in the practical end-application of scientific research in communications, in audio-, video- and electro-mechanical devices. Your needs, from design through pilot production, are supplied in a single, comprehensive plant.

Examples of these abilities applied to the commercial field are the TELOP and Sound Effects Console, illustrated above, produced for television and radio stations.

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Division of The GRAY MANUFACTURING COMPANY Originators of the Gray Telephone Pay Station and the Gray Audograph



W. E. DITMARS  
President



# CABLE OPERATIONS

## IN

# WARTIME FRANCE

By J. Mailley

During the German occupation of France the management of the French long distance lines, through its offices in the Free Zone, tried despite many difficulties to continue the extension of the long distance system in that zone, particularly the extension of the coaxial cable from Paris to Toulouse and from Vierzon to Toulouse. Lead and copper, which were very scarce in the Free Zone, were obtained through the clandestine operation of the smelting plant of the Postal, Telegraph, Telephone administration (the PTT) at Aubervilliers, in the occupied zone, in the suburbs of Paris.

The operation of the smelting plant was one of the mysteries of the occupation period. It operated from 1940 to the end of 1942 at which time German control, tightening more and more, enforced the closure and dismantling of the plant. But more than 6,000 tons of lead and copper had been shipped without any loss to the open zone, to Limoges and Riom, either by barge or by rail under false clearances. Thus it had been possible to continue the laying of the coaxial cable Paris-Toulouse (completed in late 1943), and also the construction of the cables Toulous-Muret-Saint Lys-Le Vernet serving secretly-built transmitting and receiving radio stations, as well as several local cables in the region of Toulouse and Perpignan.

### Germans' Secret Network

The German army had also secretly built, meantime, an extensive network of long distance cables for its military needs, about 3,000 kilometers in length. These cables consisted of either 2-wire loaded, 4-wire 30/12 loaded pairs of 3.2 millimeter conductors and radio pairs, or of carrier type cables of 3 or 4 quads having extra light loading of 1 milhenry every 425 meters, permitting the operation 12 channels or "6+6" channels.

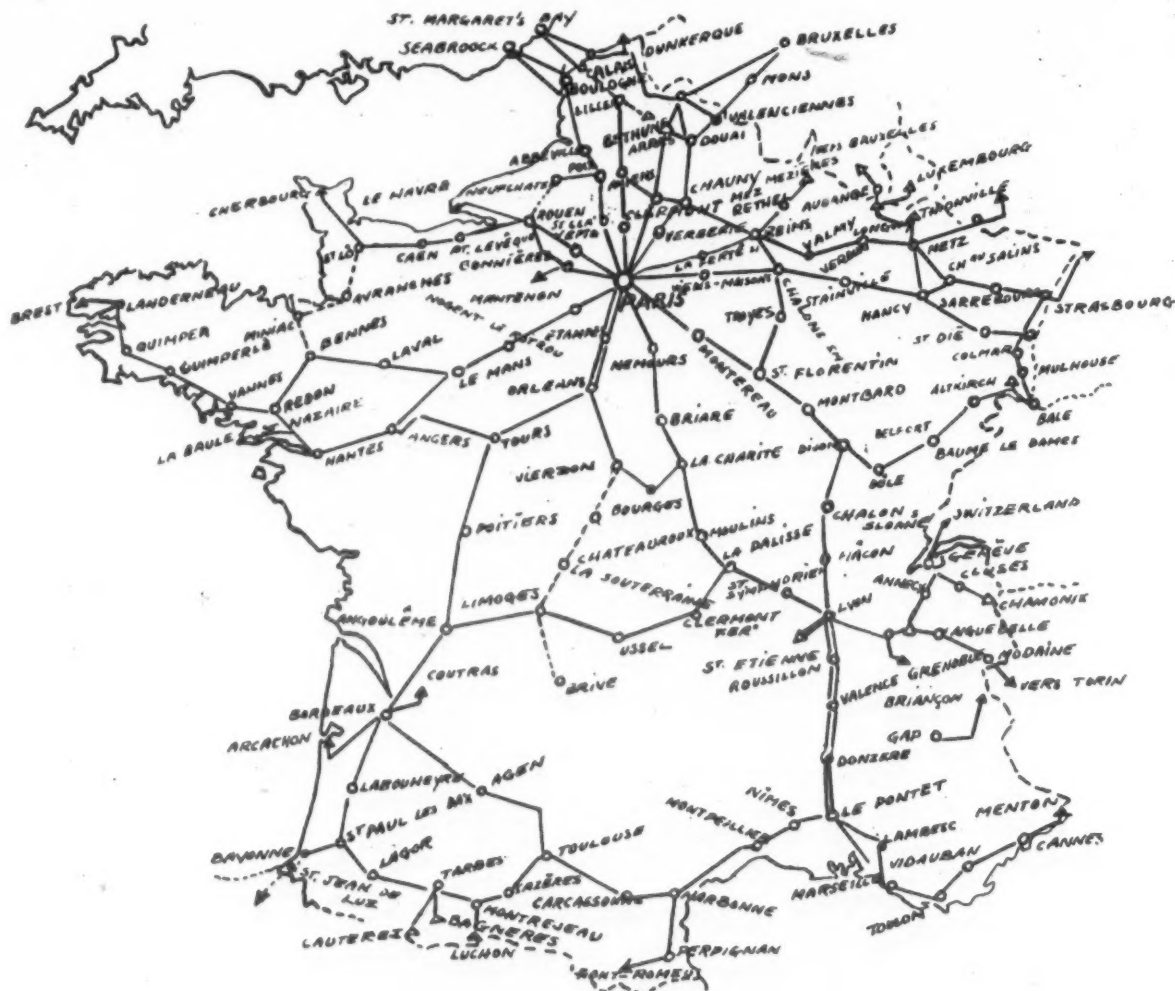
This article is an extract from "The Development and Organization Of the Underground Long Lines Network," By J. Mailley, which appeared in Vol. 3, No. 1, of "Cables and Transmission," published quarterly by the SOLETEC, 16 Rus de la Baume, Paris 8, France. Original translation by Mr. Henry Burr. Additional editing by Col. Howard Hunter, Who suggested publishing this translation in SIGNALS

After the occupation of the Free Zone, the Germans forced the PTT in 1943, into an agreement for the construction of the cable network called "Massif Central" from Toulouse to Avignon and from Maringues to Montpellier, coming together at Rodez. These were twin carrier cables each of 4 quads, and permitted the setting up of eight 12-channel systems and eight 4-wire voice frequency channels or sixteen 2-wire voice frequency channels.

### Destruction during 1944:

The long distance network which was relatively little damaged during the 1940 invasion was completely ruined by 1944. In the period preceding the Allied landing the cables suffered some heavy damage from the mass bombing of the Allies. They were also subjected to numerous cuts made by the French Forces of the Interior, in order to handicap the German communica-

Figure 1.







nixed after each repair work done by the German military crews which left alone and to themselves were making desperate but futile efforts to cope with the situation. The Allied bombardment made the situation much worse, and the repeater station at St. Lo was bombed out.

## German Destruction

During the Germans' retreat the long distance network suffered great damage. Following the demolition of bridges, large gaps (some 800 meters wide) were opened in the cables. The repeater stations too suffered systematic destruction by the Germans. This destruction was accomplished either through blowing up the buildings, burning them down, or sledge-hammering the equipment. The damage was often accomplished with a fiendish degree of precaution. For instance, water mains were cut off prior to the incendiary work and bombs were scattered in a building to burst gradually as the fire progressed in order to prevent the work of the firemen, etc.

The only stations that escaped were those located away from the main roads used by the German army; those in regions where the enemy had to fold up under pressure from the French Force of the Interior or were tumbled back by the Allied advance, as at Avranches, Calais, Boulogne; and where installations could be saved through the cleverness and self-sacrifice of the station personnel. Some of these acts of self-sacrifice were truly heroic. French agents, driven away from the stations by the enemy, lay in wait and as soon as the Germans had left and disappeared, ran into the buildings (Beauvais, for example) to extinguish

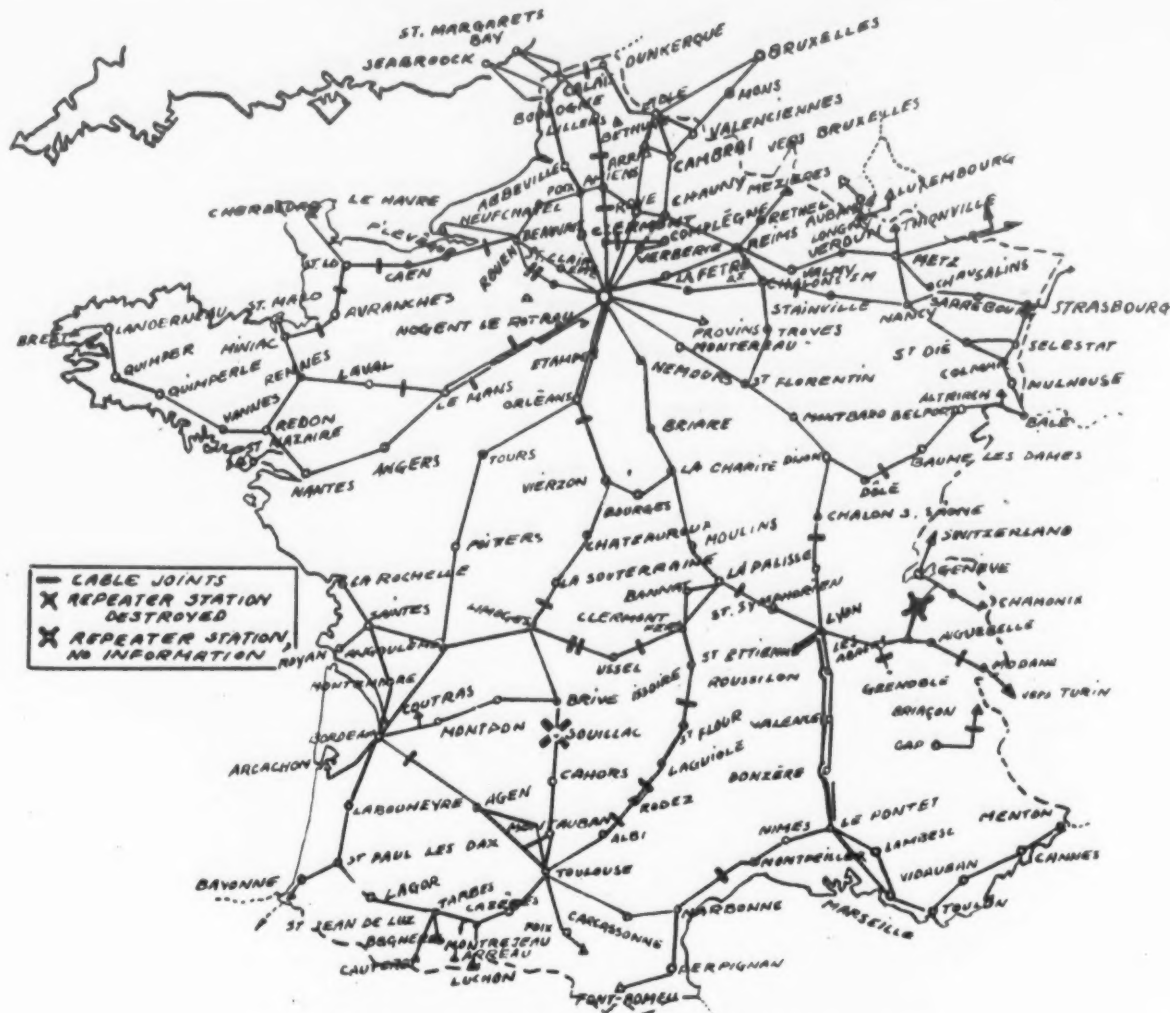


Figure 3. (Symbol — should read "cable breaks").

the fuses of bombs which would have made a shambles of the place a few seconds later.

Damage to the French long distance network at the time of the liberation was as follows:

85 repeater stations out of 130 had suffered heavy damage.

45 buildings housing repeater stations were entirely destroyed or damaged in their main parts.

There were 2,000 cuts in cables.

Reestablishment of the network after the liberation in 1944:

As the liberation progressed the service personnel of the long distance lines, fortunately, almost entirely spared, and the personnel of other companies started to work madly to accomplish temporary repairs to provide circuits to the armies and to circuits indispensable to national life. In the midst of exceptional difficulties efforts were made by all to the limit of human endurance. As an illustration, among many was the work accomplished by line crews who for several consecutive months worked 90 hours a week.

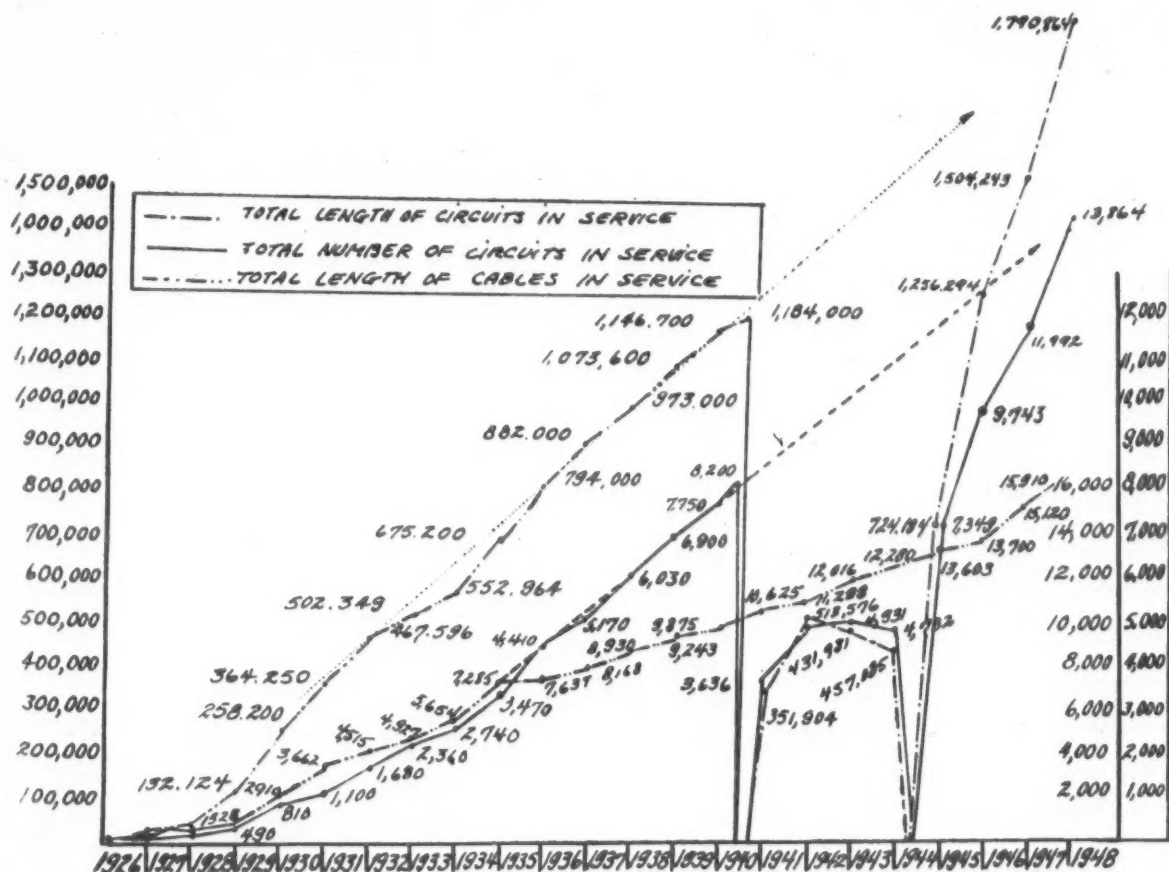
Paralleling the restoration of the cables temporary repeater stations were hastily rebuilt in parts of the damaged buildings that were not destroyed or on premises taken over (movies, school playgrounds, garages), in underground places, in casemates, and in former German field-barracks or in the clandestine depots of the service department. Some other equipment was also obtained by taking it from stations which had escaped destruction.

## Transport Difficulty

This work required a considerable number of vehicles at a time when transportation was very difficult to get and the French automotive fleet had been reduced to next to nothing. The Allied armies gave extremely valuable help by lending transportation material and by furnishing motor fuel. The two big mobile repeater stations (108 and 72 lines) existing in July 1940, and which had been saved from the Ger-

(Continued on page 64, col. 1)

Figure 4.





## INTEGRATED COMMUNICATIONS and NATIONAL DEFENSE

Communications are becoming more and more important in the defense of America. As the speed of combat increases, there is greater need for increasing the speed and reliability of communications; to maintain coherence of the fighting team.

It is the purpose of the integrated communications program of the Signal Corps to improve this speed and reliability. This program implies a great deal more than systems planning and engineering. "To integrate" means to round out into a perfect whole, and while we cannot expect absolute perfection, the interests of national defenses demand that we approach it as nearly as possible.

Let us not lose sight of the simple but controlling premise that warfare is becoming more complex every year, and that our communications must match or exceed this growing complexity. Wigwag flags and elementary telegraph that served well when the Signal Corps was created in 1863 long have been outlawed. In this modern era of jet speeds, we must be prepared to cope with a surprise attack during which a delay of only a few minutes in organizing our resistance might bring us greater loss than Pearl Harbor.

This, then, is the first meaning of our communications concept: a system so complete, composed of equipment so flexible in operation, that nothing could prevent the swift delivery of warning messages from our most distant outpost.

First, comes planning. Signals must flash from fox hole to Pentagon; from the farthest radar to the heart of government. They must link every level of command. They must consist of such a grid-like mesh of circuits, that no matter where an attack is made, there will be alternative routes to get the message through.

Second, comes engineering. Here we are concerned with flexibility of operation. Mobile units must be able to work with fixed installations; radio and wire must be able to work together; and all the interlocking of equipments must be automatic and immediate. Tactical equipments must work with the fixed, global command and administrative nets. Military communications for high command, intelligence, occupation and relief purposes, in general must be capable, if necessary, of working with civil systems.

By its very nature, such a communication system fosters that unification of the Armed Services which has become a fundamental to our defense. Long before World War II, the Army and Navy began to solve the problems of joint communications. This effort was given impetus by the war and was continued thereafter by the three major services. Through joint procedures, equipment standardization, and the marking out of areas of research and procurement, the Army, Navy and Air Force were enjoying close cooperation, in the realm of communications, before formal unification.

These implications of integrated communications

extend far beyond combat. The research of our laboratories, the cooperation we enjoy with civilian institutions, and the role of the Armed Forces Communications Association all bear on the subject.

The very spirit of research\* is a unifying one—an effort to round out the whole, to make the endeavor as nearly perfect as we can. In all of the activities of the Signal Corps there is a wide exchange of scientific information with the other Armed Services, in order that duplication of effort may be avoided and all may benefit through the exchange of scientific knowledge.

In our research and development, we seek the assistance of industrial and educational laboratories. Thus, civilian and military scientific talent are joined in the program of defense. Our research and development extends beyond communications, to the related fields of electronics, meteorology, sound, light, guided missiles, photography, and defense against radiological warfare. Civilian cooperation extends to many fields, also. In an emergency, we look to civilian communications for great assistance in carrying our domestic traffic load. We rely heavily on the National Guard and the Organized Reserve to provide a backlog of skilled personnel. Through an industrial preparedness program and the cooperation of civil industries, many plants are ironing out time-consuming details of manufacture, so that, in an emergency, production could go into high gear much sooner than otherwise would be the case. The base of national defense is broadened significantly by this teamwork of science, industry and the military.

We look to the Armed Forces Communications Association to enhance this teamwork, already of great value, between the Signal Corps, science and industry.

Let me recapitulate, in closing, that the need for integration of communications, and all its implications, are the corollary of the new complexity of war. Just as the nervous system of a man is more highly developed than the nervous systems of lower forms of life—because the whole human being is more complicated—so must be the communications of a modern fighting team be more intricate than those that sufficed in a simpler day.

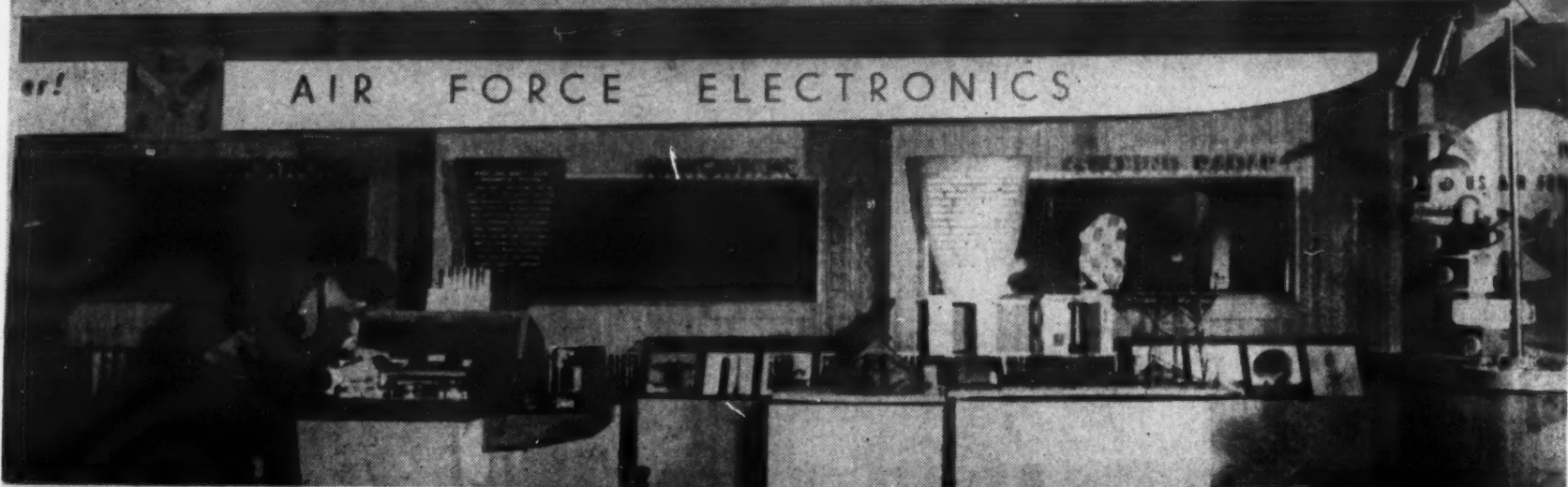
Even the splendid communications of World War II would be outmoded in a possible World War III. The Second World War itself saw a remarkable evolution in military communications equipments. This evolution must continue, for constant improvement is one of the prices of survival. In the face of new and pressing demands, we must encourage the evolution toward integration, if our military communications are to perform their historic role—providing the means of coordinating the fighting team; an indispensable element in creating a team from separate and often widely dispersed forces.

Major General Spencer B. Akin, USA  
Chief Signal Officer

\*So well demonstrated in the 16 papers presented at the recent IRE meeting, one of which was the Dr. Goubau development portrayed on this issue's cover.

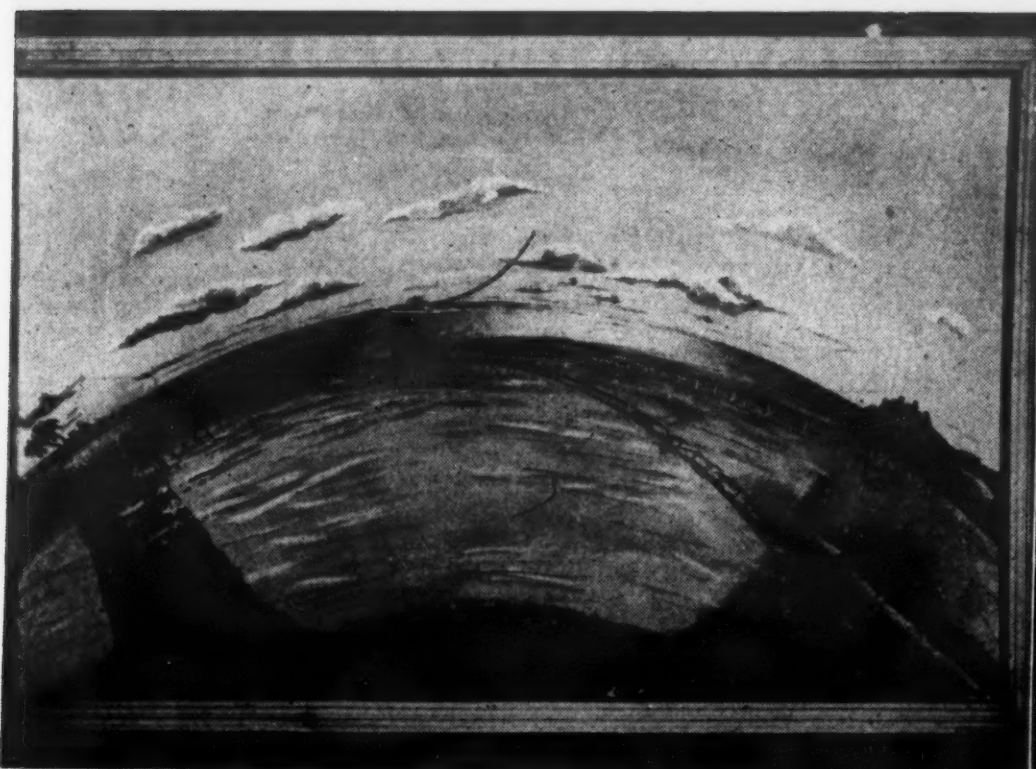


# *Electronics* in the U.S. ARMED SERVICES at the 1950 I·R·E meeting





## NAVY



### "BEHIND THE SCENES IN RADIO-ELECTRONICS" I.R.E. RADIO AND ENGINEERING CONVENTION AND SHOW

#### EXHIBIT FEATURES

TELEVISION - BROADCASTING  
RADIO - AUDIO - RECORDING  
ELECTRONIC COMPONENTS  
INSTRUMENTAL COMPONENTS  
MANUFACTURING



PRESS ROOMS  
ALWAYS

COMMONS  
GRAND

PRESS CONFERENCE  
COMING MON.

#### TECHNICAL PROGRAM

INDUSTRIAL DESIGN  
NUCLEAR SCIENCE  
COLOR TELEVISION  
ELECTRONICS IN MANUFACTURING  
COMPONENT DESIGN  
SOUND IN TELEVISION



Upper left: Diorama presentation of the Navy's new "S" bomb (SOFAR) which can be released to signal the position of transport ships in distress.

Upper right: Lt. Cmdr. Frank Bahry, electronics division, Bureau of Ships, describes the SOFAR bomb to Federal Communications Commissioner Frieda Hennock.

Center left: "Fish Talk Exhibit" attracted President Raymond Guy of IRE, and Miss Hennock of the FCC. "Fish Talk" tape records sounds of undersea inhabitants, proving clearly how the noises can set off acoustic-type mines and create sufficient interference so that enemy submarines could go past listening posts undetected.

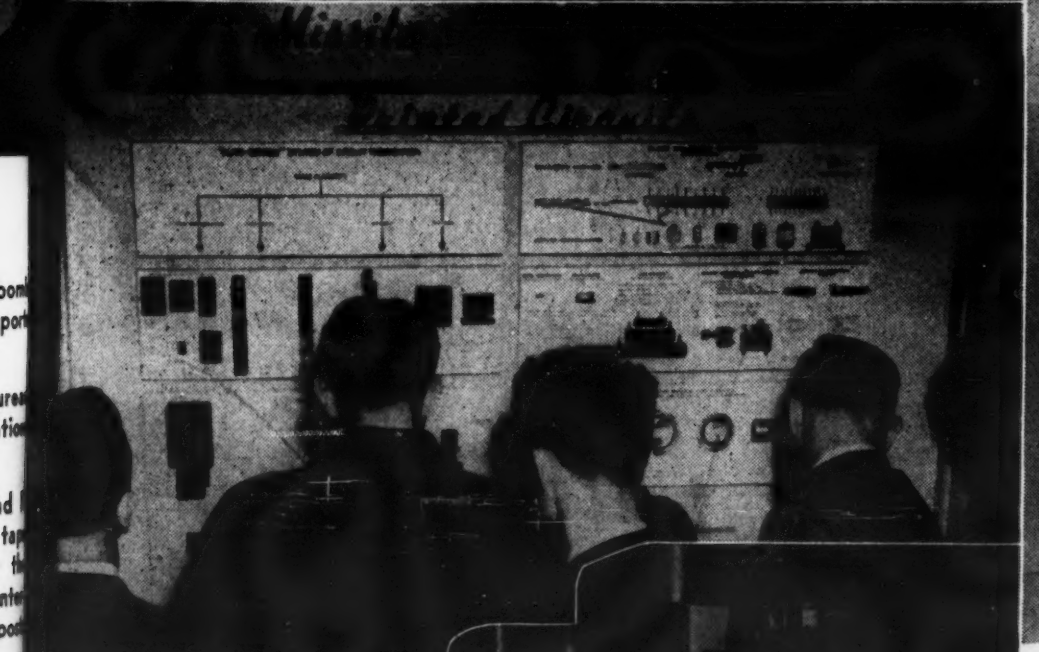
Center right: Magnetic Servo Amplifier on display. For purposes of illustration it points a toy gun mount at a submarine whenever it exposes itself at the water surface.

Lower left: "Ripple Tank." One of the toughest problems in radar design is how to keep the wave fronts accurately focused by the antenna. A secondary problem is how to make the radio waves visible for study. The ripple tank electronically produces ripples on the surface of water while enlarged shadows of the waves are projected on a screen.

Lower right: The water ripples, substituting for radio waves, are seen on the screen.



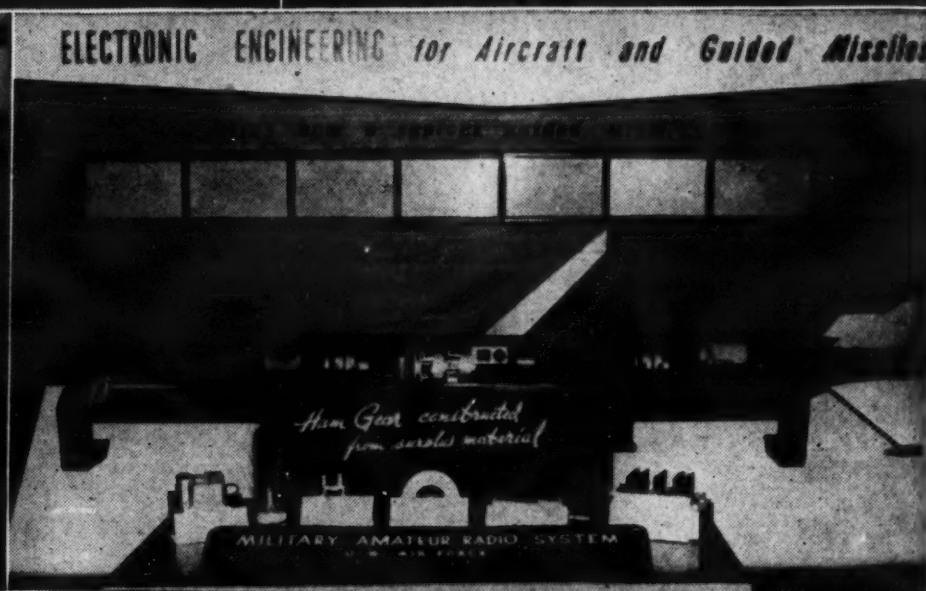
## ARMY SIGNAL CORPS



Lettering on the Signal Corps exhibits shown here make these displays self-explanatory.

Upper left: The surface wave transmission line exhibit (Dr. Goubau's "G-String," featured on this issue's cover) drew large crowds throughout the four day period of the IRE meeting.

## AIR FORCE



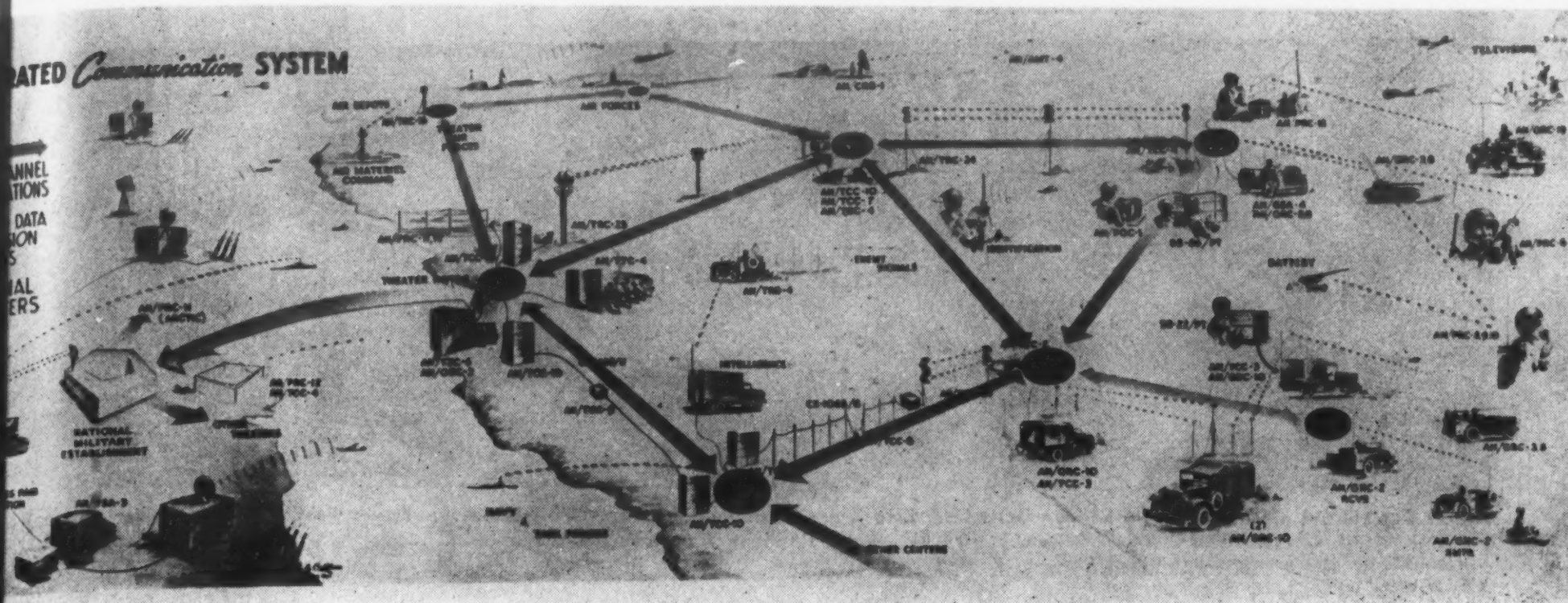
Top left: Model of the OBD demonstrator, incorporating actual equipments, permitting precise explanation of the operation and value of the omni-bearing distance navigational equipment proposed for installation in USAF aircraft.

Top center: Mr. K. Bailey of the electronics laboratory, Air Materiel Command, demonstrates the latest in airborne portable UHF transmitter and receiver.

Top right: Major General Francis L. Ankenbrandt (right), director of communications, USAF, points out features of a B-45 jet bomber model incorporating latest developments in flush-mounted antenna. Standing next to Gen. Ankenbrandt is Brig. Gen. A. W. Marriner (ret.), vice president of I.T. & T. Corporation and a director of the AFCA. Others, L to R, are Capt. R. G. Henry and Capt. John G. McKenna, USAF, and Lt. Comdr. Council, USN.

Lower photos picture displays self-identifiable by lettering on exhibits.





In a feature article in the Nov-Dec '49 issue of SIGNALS, Lt. Col. Roger C. Power, Jr., USMC, asked, "Communications—How?" The Office of the Chief Signal Officer has said that all top Signal Corps personnel read Col. Power's article with much interest, and further pointed out that nearly all of the improvements suggested by Col. Power are in process of development, or have already been completed, at the Signal Corps Engineering Laboratories, and that many of these projects were begun at the suggestion of other services. Answers to the "communications—how?" question, it is felt by Brig. Gen. Kirke B. Lawton, Deputy CSO, and others, are contained in the following article on

# SIGNAL CORPS RESEARCH and DEVELOPMENT

**By Lt.Col. Carolus A. Brown**

Office of the Chief Signal Officer  
Department of the Army

Signal Corps research and development in 1937 was a small scale enterprise housed primarily in one laboratory building with only 104 civilians, 8 officers and considerably less than one-half million dollars a year of spending money. Today it is big business involving 25 to 30 million dollars yearly, employing some 2800 civilians and 70 officers and occupying over 600,000 square feet of laboratory space. The Army was not adequately prepared signal equipment-wise at the start of World War II. If present emphasis on research and development is continued the next conflict will see the Army equipped with the best and most modern signal equipment in the world.

The Signal Corps expanded program like that of the other military

services has been due in part to the realization on the part of the Congress and other leaders that the role of science in future warfare may well determine the fate of this nation. In addition, the ever increasing use of electronic devices in warfare and the assumption of responsibility in new fields has resulted in an ever widening scope of endeavor.

## Fields of Responsibility

Currently the Signal Corps has Department of the Army responsibility for research and development in the fields of radio and wire communications including direction finding; radar; meteorological instrumentation; sound and light (sound and flash ranging, etc.); radiological instrumentation; certain areas in guided missile instrumentation; electronic countermeasures; electronic components and materials; thermionics and various related and auxiliary fields.

Within these fields the Research and

Development Board has assigned specific projects and sub-fields such as trunk terminating equipment, rear area microwave relay equipment and others to the Signal Corps as National Military Establishment responsibilities. In addition, by mutual agreement the Signal Corps conducts the meteorological instrumentation program for both the Air Forces and the Army.

A large part of the electronic components and materials program is based specifically on requirements of the Air Force. Development work for such outside agencies as the Air Navigation Development Board is also accepted when it contributes to the national defense; the general policy being to undertake as much work for other agencies as possible in those fields where the laboratories have the know-how and the requiring agency furnishes the money. The result is normally less cost to the taxpayer, better results for the requiring agency, and a broadening of knowledge and experience in the service laboratories.

The organization for research and



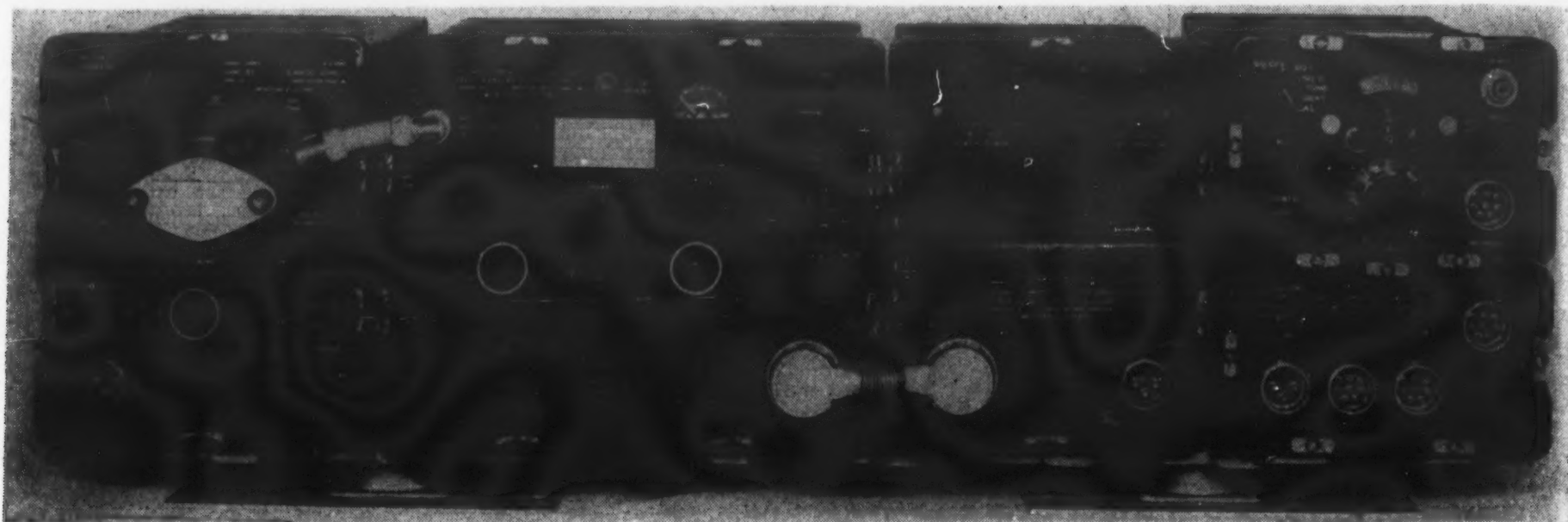


Fig. 2. Typical Set of AN/GRC 3-8 Series. Units from L to R are Auxiliary Receiver, "A" Transceiver, Power Pack, "B" Transceiver (upper) and Interphone Amplifier (lower).

development is quite simple. In Washington a group of about 50 civilian engineers and 10 officers supervise the program and handle the coordination work necessary at the Washington level. Working directly under this group is the headquarters of the Signal Corps Engineering Laboratories in Fort Monmouth, New Jersey. This headquarters has under it the three operating laboratories: Squier, at Ft. Monmouth, New Jersey, Coles at Redbank, New Jersey and Evans at Belmar, New Jersey.

It is the scientists and engineers in these laboratories who form the heart of the research and development work. The operating philosophy is that the mission of all others including the various headquarters and staff echelons is to furnish the engineer and scientist the military requirements, give him the money and facilities he needs and free him from administrative and other distracting jobs.

### Budget Limitations

Under limited or practically non-existent availability of construction funds, most service laboratories have dim prospects of ever obtaining the physical facilities needed to conduct their entire programs. Further, government salary and personnel ceilings coupled with a general reluctance on the part of many civilian scientists to work as employees of the Government, places a strict limit on the quantity and quality of scientific manpower that a service laboratory can obtain in peacetime. Consequently, it is necessary to plan a balanced program which will realize the benefit of facilities and scientific competence which could not otherwise be obtained.

A contractual program with universities and various industrial organizations is the best answer to this problem. Fiscal-wise a 50-50 division of funds between internal and external programs is the goal. However, with current fixed costs of the laboratories for personnel, laboratory supplies, travel, etc., totaling between 14 and 15 million a year, an R&D budget of 25 million allows only

40 to 44% for contracts. The Signal Corps currently has in existence some 90 contracts with universities and 300 with industrial organizations which represent a total investment of about 40 million dollars.

### Research

A well balanced military R&D program must not only be balanced between service laboratories and non-service laboratories; it must also be wisely split between research, both basic and applied, and development. Experience indicates that about 20% effort on research and 80% on development is preferable. Unfortunately the press of requirements for end items of equipment often cuts research down to about 10%. During the past four years, however, some 18 million dollars has been invested in research in fields applicable to Signal Corps responsibilities. In very general terms the Signal Corps program can claim three major accomplishments:

1. The Signal Corps engineering effort has been, and is supported by fore-running scientific investigations of such excellence that one can almost guarantee the world-wide superiority of the equipments following in the wake of our research.
2. Through contractual research many of the best scientific minds in the country are working on problems of defense interest.
3. A number of large laboratories in academic institutions, built up during the war with excellent equipment, have been maintained at a high standard of excellence. The war potential of these laboratories cannot be underestimated.

### Concern for Future

From a long-range viewpoint the nation cannot afford to see the total research effort reduced, particularly in fields applicable to military equipment and weapons. The intense development program during and after the war has

used up a large portion of the accumulated knowledge resulting from previous fundamental research.

If technical superiority is to be maintained over potential enemies 10 years hence the foundation must be laid now through continuation of a vigorous program of basic research by the nation as a whole. Within its capabilities, the Signal Corps intends to maintain a well balanced research program pointed toward the pay off of the future.\*

### Development

#### COMMUNICATIONS

Historically the major mission of the Signal Corps has been to furnish communications and communications equipment. Since it is still the major mission, the development of communications equipment occupies the leading role in the research and development program. The Signal Corps concept of what a post-war communications system should be is illustrated in Figure 1. It is commonly known as the Integrated Communications System and is composed of global, theater, and combat networks.

Integration as applied to the three networks means that they are so engineered and planned that there are no discontinuities in, between, or through them. Circuits must be such that it would be possible for the Chief of Staff at the Pentagon to talk by a combination of wire and radio circuits to a theater commander visiting a division or regimental headquarters in the combat area. Of equal or greater importance is the necessity for flexibility and adequacy of communications within the three nets, particularly in the combat net.

Before and during the war all too many of the communication equipment developments were accomplished on a piece-meal basis with little time for consideration of how equipments would

\* "Signal Corps Research Program" by Dr. Harold Zahl, Director of Research, SCEL appearing in July-August 1948 "Signals" contains a detailed discussion of the Signal Corps Research Program.



fit into the overall system. Some radios were developed to meet an artillery requirement; others to fit an armor or infantry need.

Neglect of the system concept in the pre-war planning period when Army organization itself emphasized distinctions between combat arms resulted in inadequate provisions for intercommunication between various arms by radio and inability to properly interconnect radio and wire channels. Many requirements had to be met with commercial or modified commercial items which resulted in severe supply and maintenance problems since such items were not designed originally to operate under field conditions.

### Standards Reduce Excess

Developments are now being conducted on a planned systems basis. Equipment for a military communications network meeting the peculiar requirements of the various arms and services for internal communications, the overall requirements for intercommunications, and the much to be desired wire-radio integration is gradually evolving. Further, by developing families of equipments utilizing building block principles where possible, the number of separate sets and sub-assemblies is being reduced. This in turn, simplifies the logistics problems of manufacture, distribution and maintenance. At the same time the Armed Services Electro Standards Agency's program of component and material standardization is resulting in substantial reductions in the number of individual piece parts which must be produced and distributed.

Besides taking care of current problems, the integrated system is so designed that it will meet the foreseeable needs of future war. High speed planes, supersonic missiles, airborne operations, and increased battlefield mobility will call for the ultimate in communications systems. The integration of weapons systems and the increasing use of electronic devices for intelligence purposes, point toward communications systems capable of handling television, radar data, radar pictures, high speed facsimile, and tremendous volumes of conventional type traffic. This in turn leads to automatic data transmission equipment and broad-band transmission on wire and radio relay systems.

### FM Sets Increasing

Post war developments of the equipment shown on the Integrated Communications System Chart have progressed with reasonable speed considering the peacetime limitations on funds and manpower. For example the AN/GRC 3-8 radio sets shown are now under quantity production. This particular family of sets provides FM voice communications for armor, and artillery over a normal 10-20 mile range,

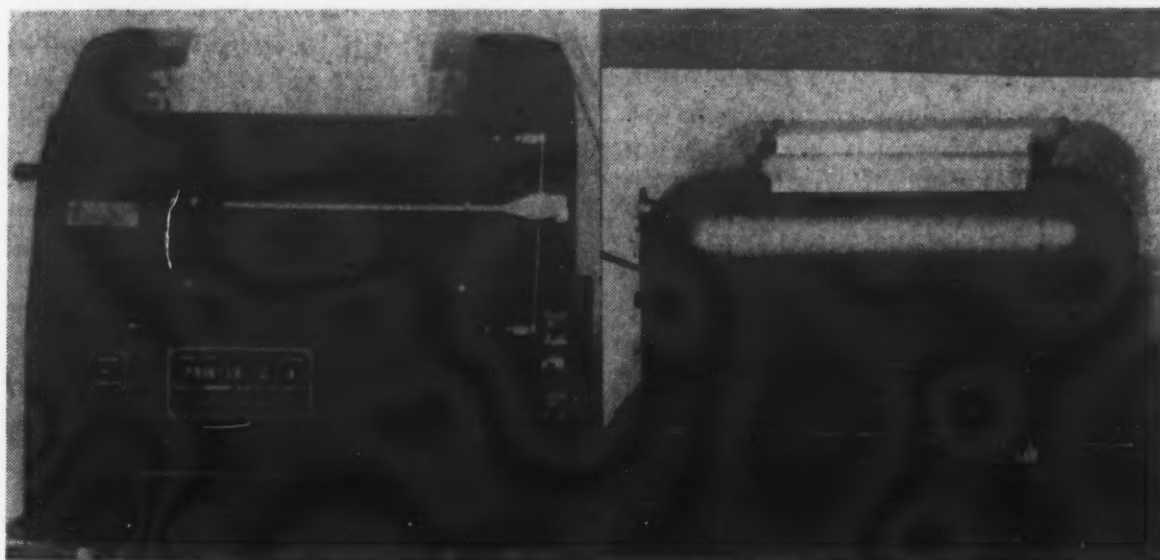


Fig. 3. Teletypewriter TG-7, 225 lbs ..... and TT-4/TG, 45 lbs — 1 man can carry. Requires vehicle to carry, 60 milliamperes necessary, 60 words per minute, not suitable for military service, requires continuous and thorough maintenance, packaging not immersion proof. 20 to 60 milliamperes required, 60 to 100 words per minute, designed for military service, rugged—fewer parts—less maintenance required, packaging is immersion proof.

replacing the SCR 508,608 etc., sets of the past war. In addition, the series provides suitable FM sets for infantry command use for the first time.

Figure 2 illustrates the make-up of a typical set in the series. The so called "A" set is the 10-20 mile range transceiver operating in the VHF band. The "B" set is a short range 1-5 mile transceiver. All "B" sets in the series cover the same frequency range while the "A" sets are broken into three ranges to provide adequate channels for armor, artillery and infantry with appropriate overlap for armor-artillery and infantry-artillery intercommunications. To obtain added range and flexibility provisions are included for retransmission from "B" to "A" or "A" to "B" sets. In addition, where 20-40 mile ranges are needed a back to back type relay set has been provided for relaying "A" set transmissions. Use of crystal saver circuits has reduced crystal requirements from 80 and 120 in the wartime series to between 11 and 21 in the current sets with a resultant substantial savings in cost.

### Miniaturization

Both the handie-talkie and walkie-talkie sets illustrated in the Integrated System Chart have just been service tested and will be placed in production this year. Miniaturization was the keynote in both developments. In the case of the walkie-talkie (Figure 3) a 3-5 mile FM set, the result compared to the war time predecessor is  $\frac{1}{2}$  the weight,  $\frac{1}{2}$  the bulk, 4 times the number of usable channels, and a considerable increase in power output. The handie talkie which was a 5 tube AM set during the war has now become a 14 tube FM voice set with 1-3 mile range in a package of about the same size.

In the radio relay field suitable sets are being developed for forward area, intermediate area and rear area use with capacities ranging from 1-96 voice

channels. (Figure 4) Based on war-time experience it is expected that radio relay will become the favored form of communication from corps to division and division to regiment due to the inherent flexibility and the speed of installation.

### Relay Systems Toughened

In the rear areas where speed is a less governing factor, the weight per mile per channel of microwave relay equipment versus cable and wire systems will automatically establish multi-channel relay systems as the backbone of the system in many cases and as the logical alternate means in others. Needless to say, all the relay systems are being designed to take the rough handling and adverse climatic conditions that are routine under field operations.

Amplitude modulated sets such as those illustrated in the Integrated Communication Chart, are being designed in two groups—one, the sets under 500 watts covering short and medium ranges for forward areas, airborne landing etc. and two, the sets of 500 watts and over for longer range communications. In the lower powered sets, after sad experiences with trying to incorporate carrier shift and other features, the trend has turned toward primary emphasis on simplicity of operation, dependability, ruggedness, and lightweight.

In the higher powered sets from 500 watts to 50,000 watts, where space, weight and operating limitations are less of a factor, a complete family with desirable carrier shift teletype provisions and other refinements are in the development mill. In line with the policy of "building block" principles the 500 watt transmitter will serve as the basic component, amplifiers and auxiliary equipment being added for additional power in the higher powered sets. Recent advances in single sideband design indicate that conventional double sideband design may be re-



placed with a proportionate savings in the seriously overcrowded HF frequency bands.

In spite of the outlook for greatly increased use of FM voice sets and radio relay the revamping of wire communications equipment is definitely not being neglected. A new tactical field wire is now in production. While weighing only 48 pounds per mile compared to 140 per mile of the famous W-110, its talking range has been slightly increased. Several critical materials in the wire itself have been reduced or eliminated and a plastic type insulation has been adopted to entirely replace rubber.

### New Cable & Teleprinter

A new and lighter weight spiral 4 field cable for 4 and 12 channel operation is well underway. Flexible coaxial cable of 192 channel capacity suitable for field use is nearing realization. The commercial and modified commercial telephone carrier equipment of World War II is being replaced by miniaturized ruggedized, lightweight systems of 4 to 48 channel capacity with the 4 channel equipment being used as the basic unit for the system.

Figure 5 tells its own story on a new page teleprinter now in production. An additional printer of the tap printing type for forward area units down to the battalion level will be out soon. Weight of the printer alone is expected to be 17 pounds. Recently developed equipment will allow the use of these printers over lower unit FM voice radios and over the normal telephone switchboard system without the use of special equipment other than at the local installation.

To be more specific, if a G-2 at division and an S-2 at regiment each had the new page printer and the newly developed voice frequency line unit in their offices, they could call each other by telephone, talk over the more urgent matters, then by a flick of a switch place their teleprinters on the line for transmission of written messages by their clerks. Such a system is promising from the staff viewpoint, but a bit disturbing when the possibilities of abuse of the system and the consequent tying up of trunk lines are considered.

### Lighter Switchboards

Lightweight rugged switchboards, while seemingly simple, have been a difficult development problem for the Signal Corps. Wartime battalion and regimental sets were entirely too heavy and bulky and very temperamental in adverse weather. A new 22-pound board, of 12-line capacity, incorporating a retractable cord for the first time in mono-cord boards, is expected to be in production this year. It will operate dependably under practically any condition, except immersed, and can, with

the cover clamped shut, be dunked in salt water without damage. Components of the same switchboard will probably be used in a 30-line unit for regimental levels.

Figure 6 illustrates the principle being applied to common battery switchboards for use at corps, army and rear area installations. The basic 3 position board, of 180 lines capacity, serves as the building block for expansion up to 2,000 lines. To eliminate soldering and to reduce installation time, plug-in cables for position interconnection, and switchboard to main frame connection have been designed. As with all field equipment, due consideration is being given to the banging, bumping and abuse the board will get in the field.

The outlook for automatic switchboards for army use is not overly bright. Problems of design for ruggedness and ease of maintenance, consideration of the military directory difficulties, and the problem of service to Generals and their staffs, make the advisability of going all out for such an expensive development within a limited overall budget somewhat dubious. In the larger rear area systems automatic trunk switching appears to have some merits. Limited study and development are underway on both local and trunk automatic systems.

### Doctrine Needed Too

Before leaving the field of communications let it be emphasized that the provision of suitable equipment will not, alone, accomplish the integration and interconnection of communications facilities into an efficient system. From research and development, the Signal Corps confidently expects to provide such equipment, but its merits will not be fully realized unless doctrine, training and organization keep pace with the advanced concepts of military com-

munications embodied in the technical premise of an Integrated Communication System.

### Radar

Except for the application of radar to meteorological instrumentation, practically all radar developments are classified; hence the reader will have to take on faith, the statement that good progress is being made and the fields where radar techniques are finding use, is ever widening.

In general, the trend for conventional type radar developments is toward higher powers, tunability, elimination of ground clutter, and miniaturization which in turn points to basic and applied research in magnetrons, storage tubes, delay lines, wave guides and other components. Pulse magnetrons are now reaching into the multi-megawatt power regions; conventional wave guides are being simplified and built by less expensive techniques; the problem of tunability of magnetrons over a reasonable range of frequency appears to be near solution; and considerable improvements have been made in clutter elimination.

### Radar Storm Detection

Theoretical investigations at Evans Signal Laboratory several years ago indicated that a radar set operating in the 1 cm region with sufficient power and sensitivity should be able to detect and locate clouds and cloud layers. The prediction was based on the concept that radar waves are scattered by cloud particles. Probably of equal validity in the case is the concept that the discontinuity between a cloud and free air causes a reflection of electromagnetic waves.

Application of the theory to actual

Fig. 4. Telephone central office set illustrating building block technique of construction.

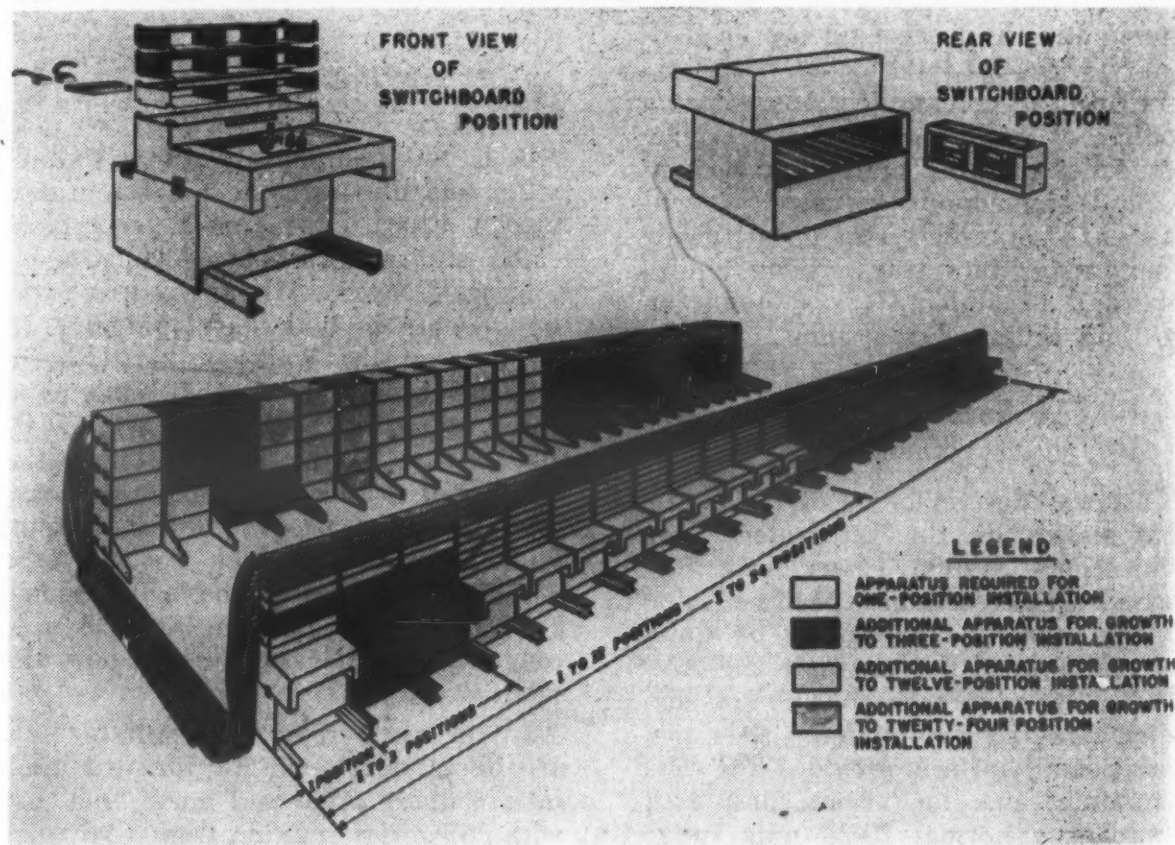






Fig. 5. Designed to surpass all present types of automatic still cameras, this Signal Corps 70 mm combat camera has a film transport to permit shooting at a rate of a picture a second. It is constructed ruggedly enough to withstand heat, cold, and rain.

equipment resulted in a device known as a cloud top and base indicator which will indicate and record the altitude of bases and tops of several layers of clouds up to altitudes of 45,000 feet and better. It is expected that the equipment will find ready use in weather forecasting, meteorological research and probably in local airport traffic control. Figure 7 illustrates a typical recording of conditions above Evans Laboratory on 16 February 1949.

Another interesting Signal Corps radar development is a storm detection equipment which will give range, height and azimuth of storm clouds in a 200-mile circle around the equipment. This one works in the 3 cm band, employs over 200 kw peak power, uses long pulses for long range detection and short pulses for close detailed investigation. The equipment is designed specifically for use by the meteorologist as an operating tool in weather forecasting. One model is currently in use on a Signal Corps research project at MIT; others are undergoing operation tests.

### Meteorological Instrumentation

The Signal Corps develops meteorological equipment for use within the Department of the Army and for use by the Air Weather Service. Within the Army primary use is for ballistic purposes, i.e., determining proper corrections for artillery, AA, and missile fir-

ing, and for local use in connection with smoke screens, etc. Air Weather Service use is, of course, directed primarily toward weather forecasting. Fortunately for the taxpayer, the basic techniques for measuring meteorological parameters are common to both services and most of the end items required are common to both.

### Upper Air Research

A recently developed RAWIN set will be a typical example of common use. This equipment, composed of a radio direction finding set with an associated recorder, is used to automatically follow and record data from a radiosonde carried aloft by a meteorological balloon. The sonde which contains temperature, humidity and pressure measuring devices, broadcasts its findings back to the ground set where they are recorded. Wind direction and speed are obtained from the horizontal and vertical angle recordings of the automatic direction finding equipment combined with the known rate of ascent of the balloon. Flights to altitudes from 90,000 to 100,000 feet are common with a recent 140,000-foot flight being the record.

Beyond 100,000 feet the Signal Corps is utilizing missiles such as the aerobee and V-2 for its upper air research program. Instrumentation for the higher altitudes is considerably more elaborate since there are requirements for

information from both a weather and guided missile standpoint.

The more conventional part of the Signal Corps meteorological program is devoted to improvement in existing methods for measuring meteorological parameters, discovery of new, more accurate and less expensive techniques, and development of equipments such as unattended weather stations. Studies are also underway on the variability of the atmosphere to discover just how much accuracy is needed, particularly for ballistic purposes.

It might be mentioned here, that the work of Nobel prize winner, Langmuir, on cloud physics (Project Cirrus) at GE is being accomplished under a Signal Corps contract jointly supported by the Navy and with airplane support from the Air Forces. Silver iodide vaporized in a hydrogen burning torch has shown considerable evidence of being able to cause cloud modifications sometimes accompanied by rain under certain conditions.

### Radiological Instrumentation

The responsibility for development of radiological detection and measuring instruments is a comparatively recent acquisition for the Signal Corps. Primarily, it calls for a line of equipments which can be used to provide the data for evaluation of the radiological hazard in contaminated areas and to measure the dosage received by individuals. While actual development is proceeding from the standpoint of requirements of the Army in the field, the equipments developed and under development will also meet the needs for civil defense as outlined in the recent "Hopley Report on Civil Defense."

Instruments have been developed for training purposes which basically are improved and ruggedized versions of conventional commercial models. One measures gamma radiation which is the greatest radiation hazard of the atomic bomb. The other measures, in addition to gamma, the beta or electron emission of radioactive materials.

### Ground Photography

The full value of tactical ground photography was not generally realized during the past war and camera equipment, in general, was not adequate to fill its potential role. Postwar effort in this field is being directed toward developing rugged cameras usable under adverse climatic and field conditions with particular emphasis on reconnaissance types for intelligence use. Figure shows a 70 mm short range combat camera.

The added emphasis on tactical aspects of photography brings up the problem of rapid developing and printing. For conventional photography improved and faster processes incorpo-

(Continued on page 60, col. 3)



# the program for NEW AIDS TO AIR NAVIGATION

Some of the equipment envisioned for air navigation and control has not even been invented yet. But the specifications have been laid down for devices which Buck Rogers might envy. No one doubts the ability of American electronic engineers to produce the needed equipment.

By D. W. Rentzel

Civil Aeronautics Administration  
Washington, D. C.

The art of piloting an aircraft from one spot to another, when the earth is invisible through cloud and storm, has progressed rapidly in the past 20 years. But today, civil and military aviation jointly are entering a revolutionary new phase of air navigation which will have a major impact on the American way of living, and on our ability to defend ourselves in case of war.

Back in the days when an airplane was a novelty, a pilot could fly when and where he pleased without fear of collision, providing he maintained a safe altitude above the ground. The notion of air traffic control would have amused and amazed him.

But by the early 1930's, enough air traffic had developed to make definite airways necessary, particularly in the more congested areas. Too, the need for guidance when the pilot no longer could see the earth became more and more pressing. As a result, the Federal Government installed a system of airways throughout the country, using the best radio devices known at that time.

## ILS

This air navigation system centered largely around four-course low-frequency radio ranges, plus radio-location markers, and low- and medium-frequency voice communication channels. Just before the start of World War II, the

Civil Aeronautics Administration began installing very-high-frequency instrument landing systems (ILS). This system, which provides radio beams down which a pilot can fly his plane until he sights the runway, was adopted by the military forces.

The low-frequency ranges and communication systems served a useful purpose, and still are in general use today. But they have serious drawbacks, and have been outmoded by new electronic inventions which appeared before and during the war.

Those of us who travel by commercial airlines know how uncertain the schedules are during periods of bad weather. This uncertainty has been a grave handicap in the development of air travel, and has slowed down the growth of air freight and air express. It has caused the airline companies tremendous annual losses.

## Definite Program Agreed On

This outmoded air navigation system also has seriously handicapped our military air operations using the same system during instrument weather conditions. Speed is the essence of modern warfare; in case of sudden attack we must be able to move large numbers of military aircraft quickly and unerringly to the points where they are needed. The enemy will not wait for favorable weather, or give us time to acquaint our pilots with unfamiliar devices.

Fortunately, all significant groups connected with civil and military aviation have agreed on a definite program to modernize our airways and make all-

weather flying a universal reality. This program was developed through the Radio Technical Commission for Aeronautics, and the plan itself is commonly referred to in aviation circles as "SC-31," because it was prepared by Special Committee 31 of the RTCA.

The first, or transition, phase of this revolutionary new air navigation program will be completed about 1953. A good start already has been made in developing and installing the new devices needed for this part of the program. The ultimate program, which envisions some devices which a highly imaginative Buck Rogers might envy, is scheduled for completion about 1963.

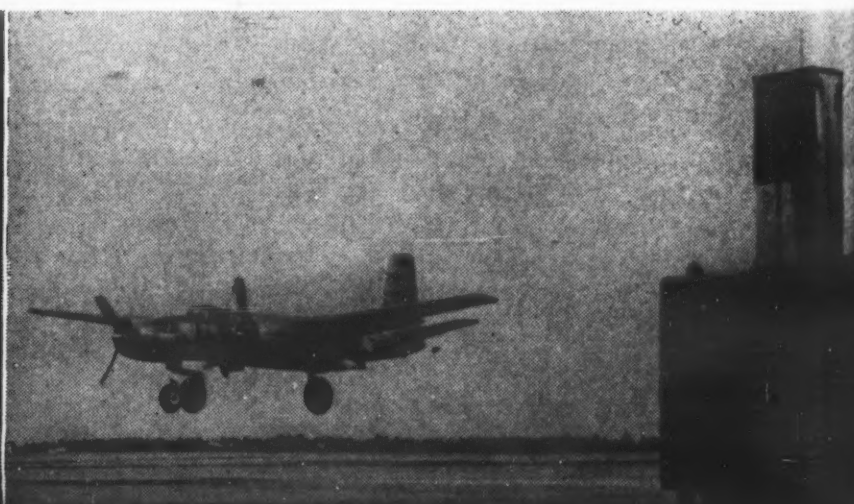
## Omniranges

Now let us look at some of the old and the new air navigation equipment. Earlier, I mentioned the four-course low-frequency range. This range offers, as the name implies, only four paths to or from the range. In order to stay on one of these courses, the pilot must listen continuously to dots and dashes which blend together when he is in the exact center of the airway. Needless to say, this is exacting, and during thunderstorms and periods of heavy static, the range becomes difficult and even impossible to hear. There is danger, too, of the pilot confusing the courses and flying on a wrong heading.

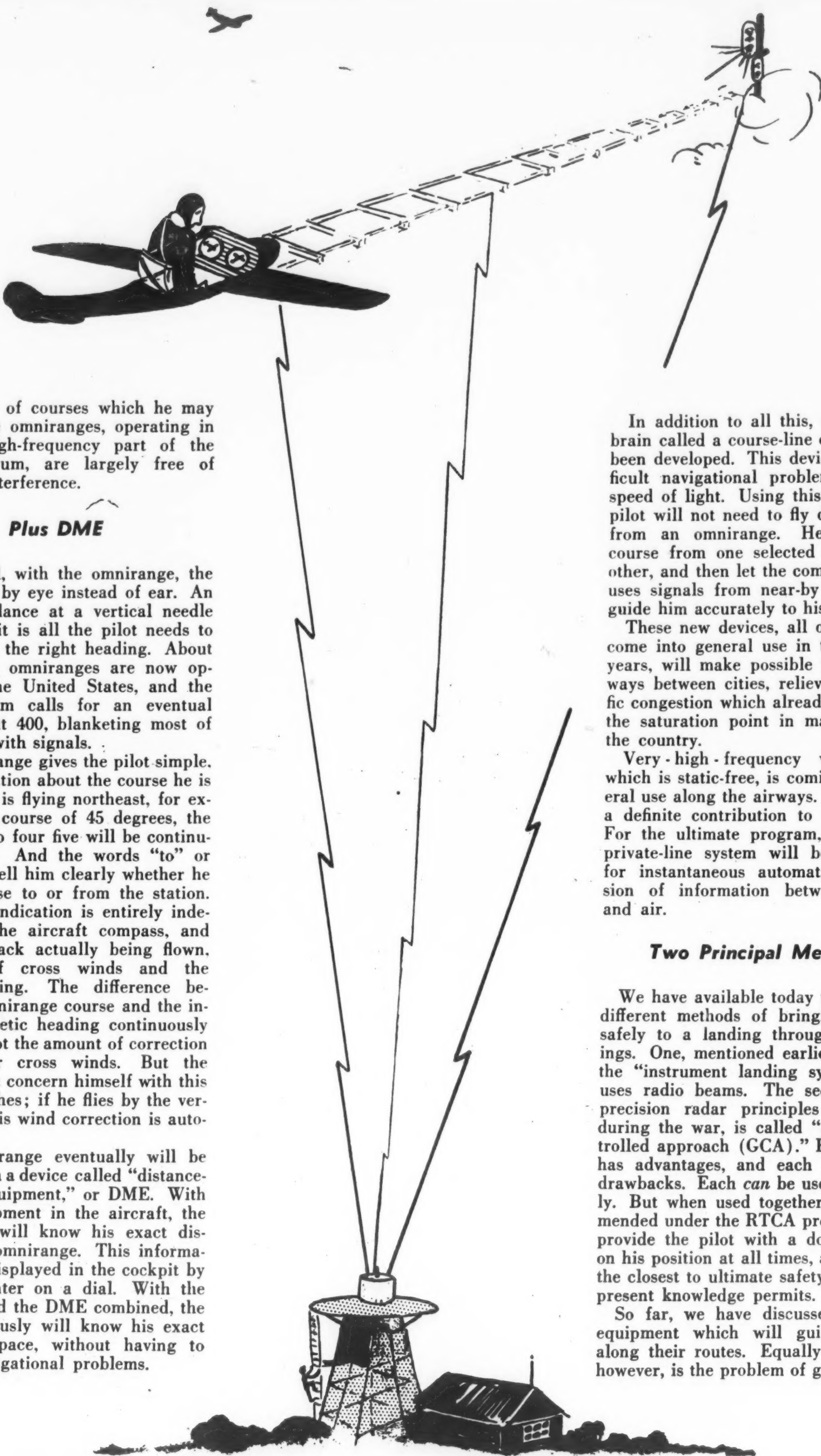
To replace this kind of range, the CAA has been installing what is known as omnidirectional, or omniranges. These offer the pilot an almost unlim-

Courtesy Proceedings of the I.R.E.

The two basic landing systems presently in use, ILS and GCA.







ited number of courses which he may fly. And the omniranges, operating in the very high-frequency part of the radio spectrum, are largely free of static and interference.

### Plus DME

Best of all, with the omnirange, the pilot can fly by eye instead of ear. An occasional glance at a vertical needle in his cockpit is all the pilot needs to keep him on the right heading. About 250 of these omniranges are now operating in the United States, and the CAA program calls for an eventual total of about 400, blanketing most of the country with signals.

The omnirange gives the pilot simple, clear information about the course he is flying. If he is flying northeast, for example, on a course of 45 degrees, the numerals zero four five will be continuously visible. And the words "to" or "from" will tell him clearly whether he is on a course to or from the station. This course indication is entirely independent of the aircraft compass, and shows the track actually being flown, regardless of cross winds and the plane's heading. The difference between the omnirange course and the indicated magnetic heading continuously shows the pilot the amount of correction necessary for cross winds. But the pilot need not concern himself with this unless he wishes; if he flies by the vertical needle his wind correction is automatic.

Each omnirange eventually will be equipped with a device called "distance-measuring equipment," or DME. With suitable equipment in the aircraft, the pilot always will know his exact distance to the omnirange. This information will be displayed in the cockpit by a simple pointer on a dial. With the omnirange and the DME combined, the pilot continuously will know his exact position in space, without having to work out navigational problems.

In addition to all this, an electronic brain called a course-line computer has been developed. This device solves difficult navigational problems with the speed of light. Using this computer, a pilot will not need to fly directly to or from an omnirange. He can set a course from one selected point to another, and then let the computer, which uses signals from near-by omniranges, guide him accurately to his destination.

These new devices, all of which will come into general use in the next few years, will make possible multiple airways between cities, relieving the traffic congestion which already has passed the saturation point in many parts of the country.

Very-high-frequency voice radio, which is static-free, is coming into general use along the airways. It is making a definite contribution to safer flying. For the ultimate program, however, a private-line system will be developed for instantaneous automatic transmission of information between ground and air.

### Two Principal Methods

We have available today two entirely different methods of bringing aircraft safely to a landing through low ceilings. One, mentioned earlier, is called the "instrument landing system," and uses radio beams. The second, using precision radar principles discovered during the war, is called "ground-controlled approach (GCA)." Each system has advantages, and each system has drawbacks. Each can be used separately. But when used together, as recommended under the RTCA program, they provide the pilot with a double check on his position at all times, and achieve the closest to ultimate safety which our present knowledge permits.

So far, we have discussed the new equipment which will guide aircraft along their routes. Equally important, however, is the problem of getting them



safely into the air, and onto the ground, during low visibility. For all-weather flying, this is just as important as safe and reliable navigation en route.

## **ILS**

With the "instrument landing system (ILS)" two radio beams are transmitted from the airfield. Received aboard the aircraft, these beams operate a cross-pointer indicator, which is simply a dial with two needles crossing in the center. The vertical needle, which also is used with the omnirange, tells the pilot whether he is properly lined up with the center of the runway and, if not, which way he must turn. The horizontal needle tells him whether he is above or below his proper glide path, and how to correct his descent, if necessary.

The ILS system is simple, positive, and in wide use by our scheduled airlines. Already, it has permitted the CAA to lower landing minimums from 400-foot ceilings to as low as 200 feet in many locations, greatly improving schedule reliability. Similar reductions in ceiling minimums have been approved where radar systems are in use.

The radar landing system, called "ground-controlled approach (GCA)", permits a controller on the ground to "talk the pilot down" over ordinary voice radio channels. The ground controller watches two radar screens.

## **GCA**

The first, known as the surveillance radar screen, enables the operator to locate aircraft flying within a 30-mile radius of the airport. After positively identifying the aircraft on approach as a particular dot on the screen, the controller guides him safely into and through the holding pattern.

When the plane is ready to head in for a landing, a precision radar screen comes into play. The correct path to the runway is shown by lines on the screen, and if the dot representing the plane gets off the lines, the controller tells the pilot exactly how to correct his course.

This ground-controlled approach radar may be used independently, or to monitor an approach made on the instrument landing system.

At present there are about 80 civilian instrument landing systems in operation. We have improved-type surveillance and precision radar equipment for ground-controlled approaches at LaGuardia Field in New York, at Washington National Airport, and at Chicago. As rapidly as funds and manufacturers' delivery schedules permit, we are installing additional GCA radar sets at the busiest airports.

At other large airports CAA is planning to install the surveillance radar unit alone. This will permit the traffic

controller to watch all the aircraft in his vicinity through radar, even when the weather has closed in. The controller can be certain that each plane is in its reported position, thus reducing collision hazards and speeding up the landing and takeoff sequences at the airport.

There has been some misunderstanding by the public of the whole subject of radar. Many people believed that war-developed radar would, in some magic way, instantly transform aviation into an all-weather transportation system, free of hazards and navigation problems. Ultimately, it promises to do just that. But we still have quite a way to go.

## **War Radar Not for Civil Use**

For one thing, military ground radar equipment designed for use on the fighting fronts proved to be inefficient and unsatisfactory for everyday civilian use. An extensive program was necessary to design, test, and produce ground radar which is economical and equally useful for civilian and military aircraft.

Airborne radar, as produced during the war, was a heavy item of equipment. Also, it required one or more men to operate it, in addition to other members of the crew. Overseas, where there were no other navigation aids, it was a necessary piece of military equipment, well worth the extra weight and manpower.

But in a country like the United States, with adequate navigation aids, airborne radar of the wartime type cannot justify itself in commercial operation. A pilot can get far more navigational information from radio ranges, and use it more easily, than from radar equipment in his plane.

However, airborne radar does show promise in two special fields. Numerous experiments have indicated that a satisfactory light-weight radar can be produced which will help pilots to detect and fly around thunderstorms and other turbulent areas. Eventually, also, someone may develop a satisfactory radar collision warning device.

## **Precision Systems Coming**

New applications of radar and television really will come into their own in the ultimate RTCA program, which will provide an air traffic system of almost inconceivable magnitude and precision. Some of the equipment needed has not yet been invented. But the specifications have been laid down, and the principles on which it will operate are understood. No one doubts the ability of American electronic engineers to produce the needed air and ground devices.

Here, in a general way, is how this ultimate air navigation system will work:

Even before a pilot takes off on a flight, a landing time will be reserved for him at his airport of destination. As he flies along, a dial will tell him in minutes and seconds whether he is ahead or behind his exact schedule, and he will slow down or speedup accordingly.

## **Full Picture for Pilot**

In the cockpit the pilot will see a pictorial presentation of everything around him. This picture, probably televised to him from the ground, will show his own aircraft in relation to others in his vicinity, indicate obstructions or other hazards, and even show the location of storms and turbulent air.

At the same time, radar will be continuously watching him from the ground. By means of a block system something like that used on railroads, the pilot will be assured that he is in safe air space at all times.

The aircraft of the 1960's will carry equipment which continuously transmits to the ground the readings of the various cockpit instruments. Electronic brains on the ground will check these readings automatically against information derived from radar and other sources. If, for example, the altitude shown by ground radar differs from altimeter reading in the cockpit, the pilot will be instantly and automatically notified.

If the pilot wishes to change his altitude or his flight plan, he will be able to query the ground stations by pushing an appropriate button. Approval or disapproval will be flashed back to his cockpit in a fraction of a second, since the calculations will be made by automatic machines on the ground.

## **Reliable Schedules Seen**

This ultimate system, fantastic though it may sound, is designed to meet the everyday needs of civil and military aviation 15 years hence. It will, of course, solve the weather problems which plague aviation today, and it will permit aircraft to fly their schedules with clocklike precision and absolute reliability.

Furthermore, the RTCA system is designed with military as well as civilian requirements in mind. In case of war, the system will give instant warning of unfriendly aircraft, and permit interceptors to be vectored to attack. It will permit quick and heavy concentration of airpower anywhere it is needed within the country, and then will assist in maintaining a continuous flow of supplies and manpower to that area.

This tremendous new program, on which the Army, Navy, Air Force, and CAA are jointly agreed, will open the way for a whole new era of aviation in which the blessings of fast, safe, reliable low-cost transportation will be shared by every American citizen.



# RADIO STUDIO— military style

By Captain Eugene F. Coriell

Radio Instructor & Studio Officer  
Armed Forces Information School  
Carlisle Barracks, Pennsylvania

It was close to midnight. In the control room of the post studio, the engineer hunched over his board, nervously fingering the remote cue mike. In the post chapel some blocks away at the other end of the remote circuit, the Wac vocalist and the organist eyed the remote technician who waited for the cue with his ear glued to the handset of the EE8.

Back at the studio, the director's arm came down. The engineer relayed the cue into the mike, switched the remote line into the mixer and prepared to ride gain on the vocalist.

Then it happened—instead of the liquid tones of the soloist, the monitor speaker gave out with a stentorian voice that boomed through the chapel and bounced off the rafters. One sentence stood out above the general uproar: "Cut out this caterwauling—or stand arrest in quarters." There was sudden silence as the remote technician cut the feed to the studio.

Afterward, it was all very anti-climatic. The deputy C.O., whose quarters adjoined the chapel, had simply taken drastic steps to assure the sleep the previous organ and vocal rehearsal had denied him. While he forgave and forgot next morning, the incident illustrates some of the lengths to which we were ready to go to carry out the radio public relations job assigned us.

The chapel incident occurred at Brookley Field in 1945, while we were making an audition platter of a new transcription show we hoped to do weekly for WWL in New Orleans. With five live shows originating weekly in our own studio, there just wasn't time to do the audition job during the day,

so the staff decided to do it at night, and at their own expense.

Sitting up here now in the handsome studio at Carlisle Barracks, where we have legal status and even a few dollars of appropriated funds, now and then, it's a little hard to realize how different things were only a few years ago.

## How It Began

It started early in 1944 when, just back from a two-year tour in the Caribbean, I arrived at Brookley Field, the Air Force Depot in Old Mobile, as an urgently-needed base automotive officer. The only difficulty was that the field was filled with base automotive officers.

After the fourth day of being interviewed by section chiefs who had no opening for me, I volunteered some startling intelligence: Away back in 1933, I had been the chief announcer—also the only announcer and sometimes the control operator and the production man—at WCAP at Asbury Park on the Jersey coast. I also confessed to some related electronics background.

The Brookley personnel officer recognized salvation when he heard it. It happened that the commanding general wanted the existing broadcasting project revamped, so I was practically thrown at the public relations officer who promptly lowered the boom. "Radio," he pronounced grimly, "is thoroughly loused up on this base. You can't make our shows any worse.



Captain Eugene F. Coriell is presently radio instructor and studio officer at the Armed Forces Information School, Carlisle Barracks, Pennsylvania. He has been on active duty since August 1941 when he was called to service, having been commissioned in the infantry reserve upon graduation from Rutgers University in 1933. He served two years in the Caribbean Theater from October 1941 to November 1943 as an Air Force automotive officer and squadron commander. All his service since then has been in military radio, either as O.I.C. of an operating broadcast studio or as radio instructor in military public relations schools.

After graduation from Rutgers Captain Coriell became announcer and production man at WCAP, Asbury Park, New Jersey. From 1934 to 1941 he was with the Mack Truck Company as experimental engineer with duties including design and operation of automotive test equipment, testing of lubricants and electrical equipment, sound recording, and analysis of gear noise and related acoustical problems.

Maybe you can even make 'em better. Get going."

The broadcasting project at that time consisted of one p.f.c. who didn't care, and two weekly shows that sounded like it. The purposes of the programs were to emphasize to the people of the Mobile area the importance of the Brookley Field depot to the war effort, to explain our supply and manpower problems, to solicit the aid of the town in their solution, and to show the importance of the depot to the civic and commercial life of the Mobile community.

Since the base wanted to improve and expand the radio activity, it was obvious we would have to have our own studio. The two Mobile stations were undermanned and didn't have the facilities to permit rehearsal and production of five Air Force shows a week, especially in war time when



equipment and personnel were scarce. So I suggested to the PRO that we build our own studio, and after a check with the front office, he OK'd the project, with the warning that no funds would be available for construction or operation. However, word went around that the studio was to receive all possible assistance, which was plenty.

### Problems and Problems

The first step was to obtain a building, and a freshly-painted barracks was it. It was no problem to get the post engineer to make the necessary structural changes, but getting needed equipment was something else. There was also the little matter of carrying on and improving existing programs in the local station studios. Fortunately, both of these problems were relieved by the arrival of one PFC Anthony J. Leighton.

Tony Leighton was a one-man production staff with a background of many years in commercial radio work and show business in general. He wrote scripts, announced shows, painted studio furniture, and directed the most complicated production sequences on the air with effortless precision. To these not inconsequential traits, he added those of even temperament and a liking for hard work.

So while Leighton kept us on the air from the studios of Mobile stations, I scrounged for equipment for our own studio. It was no problem to acquire a couple of Sandwick MC364B turntables, such as they were, and there were plenty of tools and tests equipment for issue in depot warehouses. But one thing there wasn't—a studio

control board or console. Nor was there any money to buy one. I used to look hungrily on the RCA 76B boards in the town stations, and finally realized that if we were going to get a console, it would have to be home-made.

Upper photo: studio of the Brookley Field studio in 1945. Left to right: Capt. Jack Bitterman, PFC Helen Rollo, vocalist and writer; Sgt. Anthony Leighton, program director; Capt. Coriell, the author; S/Sgt. Lehman T. Arnett, chief technician; Gladys Ferrill, pianist and organist; Cpl. Bud Mast, announcer and writer. Two on extreme right unidentified. Lower: scene from band broadcast from Brookley Field studio, carried over WALA, Mobile in 1945. Note monitor phones hung on posts for convenience of band leader and program director.



The upper photo: studio at Craig Air Force Base, 1946. Present studio at Armed Forces Information School compares favorably with commercial network installations.

Neither Leighton nor I had ever built a console, but we listed all the things we thought a console ought to do and then went downtown to WALA to see how these items stacked up against the features of their 76B. Our ideas didn't suffer too badly by comparison, and we were all set to build the board—except that there was no technician on our staff of three. Then along came another lad who was as good in the electronics business as Leighton was in the production end.

The newcomer's name was Sgt. Lehman T. Arnett, probably one of the best all-around electronics men in uniform. Arnett had never built a console either, but we went into a huddle and the result was that I prepared the detailed drawings for the mechanical parts of the console while he figured out the circuits—and how to utilize Signal Corps aircraft radio equipment components for high-fidelity broadcast work.

### Aircraft Salvage Parts

The depot shops at Brookley made the aluminum panel and chassis from a salvaged aircraft wing, and the wooden end pieces for the cabinet came from some beautiful walnut that just accidentally happened to be available. Six months after we opened the studio, the console was finished. WALA graciously paid for a line into their transmitter and we were on the air.

But we still had problems—funds, for example. We did very well on items from the depot warehouses and from



the piles of gear that came back from overseas—but there were some things that just had to be bought. So, the fiscal officer having only sympathy to offer, we decided to make money at home, as the ads say.

### Studio Fund Started

Pending completion of the control console, we had rigged up a makeshift mixing and monitoring arrangement consisting of a borrowed p.a. system and a couple of Special Service turntables, all tied together with make-shift switch-box. We decided to pipe ten minutes of news and music over a telephone line into the sound system of the post theater just prior to each of the two nightly movies, at a price of one dollar per show.

Somewhat to our surprise, the Air Inspector approved the scheme which called for payments from the Central Post Fund. So we set up a special welfare fund called grandiosely the "RADIO BROADCAST STUDIO FUND," complete with fund council and council book. Due to carefully nurtured relations with the said council, I had a pretty free hand in the use of the funds and used it for such purposes as the purchase of an improved output transformer for the console, sound effects records, etc.

### P. A. Jobs Too

As the reputation of the Brookley Field studio grew, so did the demands made on us for related but not strictly radio jobs. We once set up a good-sized public address system for some outdoor rally, as a favor to the base communications officer—and that was a mistake. Every time a good-sized p.a. set up was needed thereafter, we had to do the job, and while it was great experience, it took time that should have been spent in our primary technical mission of maintaining the studio equipment.

I recall one p.a. job in particular that took four days to set up, for use with a travelling Treasury Department war bond show. The show consisted of a demonstration of an airborne unit jumping from their planes and setting up a full-scale infantry attack in front of the grand stand. The show was realistic in the extreme, featuring artillery and colored smoke, with gliders landing right in front of the spectators.

Since the front to be occupied by the crowd was about a quarter of a mile long, we had to set up fifteen horn-type speakers on poles one hundred and twenty-five feet apart. To guard against feedback and to prevent possible failures from affecting more than one speaker, each speaker was fed from a separate amplifier.

These amplifiers were racked under a tent, all of them being driven by a common preamplifier. The idea we worked for was to reduce to a minimum



Upper: front view of control console, Brookley Field radio studio. Board was patterned after RCA type 76B. All electrical components were Signal Corps issue except VU meter and output transformer. Sheet metal work was done in depot shops utilizing salvaged airplane aluminum sheets. Lower: control room, Brookley Field studio, 1945. Control board was built by studio chief technician, S/Sgt. Lehman T. Arnett. Two Presto broadcast turntables were donated by Brookley Field Civilian Welfare Association.

the areas in which speaker sound fields overlapped, and we succeeded surprisingly well. This was due chiefly to Sgt. Arnett's skill in hooking up some fifteen borrowed amplifiers of many makes and impedances to fifteen equally miscellaneous speakers.

We took elaborate precautions against failures, including the use of a technician on constant patrol with a handie talkie and a dependable old EE8 which could be clipped on to a communication pair that paralleled the speaker distribution cables up and down the crowd front. This arrangement made possible quick repairs on a defective speaker without disturbing spectators listening to adjacent horns.

### Welfare Group Assists

Another non-radio job we inherited was the operation of the base public address system. More accurately, the job involved building as well as operating the system, and grew out of our excellent relations with the Brookley Field Civilian Welfare Association.

This group had been most cooperative in supplying our studio with items for which we had no funds. For ex-

ample, they brought us our first amplifier, our first professional turntables, and the materials for soundproofing the studio.

So when the Welfare people said they'd like a network of public address systems set up in certain buildings and outdoor areas on the base, we were very glad to do the job for them and to feed the network with a daily schedule of news, announcements and music from our studio. The speakers and amplifiers, for the most part, came from the salvaged electronic gear scrounged from the Brookley Field dock where Liberty ships unloaded gear sent back from overseas.

We even had romance, along with our more technical adventures. One of the WAC's on the base was a very talented singer and after a few appearances on our shows, she became a member of the studio staff under Leighton's supervision. Her name was Helen Rollo and she was probably the most versatile woman who ever worked in a studio. She sang, ran the control board, wrote script and announced shows. In odd moments, she found time to do a top job as a dramatic actress and to take part in civic activities in town. To these traits, add more-than-average attractiveness and you have the kind





Rack of amplifiers set up at Brookley Field for war bond show.

of girl who's destined to go places. Specifically, she went to the altar with Leighton, and I had the pleasure of giving the bride away. I've been partial to radio romances ever since.

With the coming of V-J day, the studio staff began to leave for civil life and within a few months, Leighton and I were the sole survivors, as we had been the sole pioneers two years before. Then Leighton got his discharge and a job in Mobile with WABB which was then being organized. A little later, I was offered a detail teaching radio writing and production at the old Air Force Public Relations School at Orlando, Florida. I agreed provided I could take the studio along for use as a student training aid.

### Move to Orlando

Orlando must have packed quite a punch at the Pentagon because we soon had orders to pack up the equipment and ship it to Orlando. I took along every spare nut and bolt, and it was a good thing, too. We found ourselves pretty much on our own, and there were no funds for local purchase. I built the studio practically single-handed and at the same time taught writing and programming. This pair of chores kept me out most of the day and night, and threatened a major domestic crisis until I located and re-enlisted a recent dischargée who wanted to learn the audio business.

After three rugged months at Orlando, orders came to move the school

up to Craig Air Force Base at Selma, Alabama to become part of the new Air University. So we again packed up everything we owned or could chisel and headed for Craig in June of 1946.

### And Craig

The Air University with headquarters at nearby Maxwell Air Force Base had just been organized a few months previously and like all new organizations, it had some rough spots. For example, someone had awarded the contract for modifying the radio studio building for our use without including the features we had requested.

There was also the little matter of Signal supplies—or rather, the lack of them. We were welcome to anything in the warehouses at Craig and at the Mobile depot, but requisitions that had to be sent elsewhere often didn't produce the goods. And as usual, there were no funds.

It wasn't long before we had to resort to an expedient which the same circumstances had forced us to use at Orlando. Very unofficially, the financial situation was explained to the students before graduation, and they were invited to contribute one dollar each to keep the studio in operating supplies. No pressure was put on the students, and they had to take the trouble to walk a block out of their way to deliver the buck to my office. However, most of the students kicked in, and since the classes averaged around thirty-five students, our operating budg-

et averaged around thirty dollars per ten-week semester. That didn't go far but it kept us in fittings, spare parts, and other items that didn't arrive through channels.

Some odd things went on during our two-year stay at Craig, and one of these was the weekly show we piped from our studio to WABB and WGWC in Selma. We had arranged for this show so that the students could get a little experience on the air, to supplement the instructional sessions.

### Student Shows

We soon found out that we, the staff, would have to write the script ourselves, at home in the evening. We also found out that broadcast of student shows just wasn't practical with the small amount of instruction time available. If we put the poorest students on the air, on the theory that they needed the experience most, the town got a poor show. On the other hand, if we put our best students on the air to assure the town a well-done show, the poorer students who needed the experience most didn't get it. The outcome was that we turned the show over to the base PIO who had just graduated from our course, and said, in effect: "Here y' are, Bub. Thanks for taking it off our hands."

While at Craig, we found out the hard way that radio instructor personnel acquire more than instructional duties. Every once in a while, the base would want a special program commemorating some occasion or other, and always, the base PIO, whose job it was to do such shows, would claim with some truth that he didn't have the facilities, the manpower, etc. So the school studio would do the job. We sometimes found ourselves out on a limb as a result.

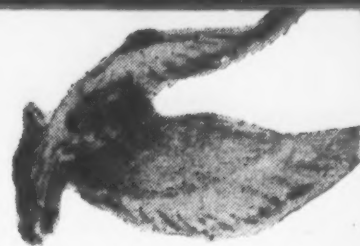
### Memorable Easter Broadcast

For example, the Easter sunrise service. The chaplain wanted the service broadcast, and since the show involved considerable equipment, we were up all night getting things ready. By a lot of trial and error, we got the various mikes located and balanced for minimum phasing effects and best pickup. Bleary eyed and shivering in the unseasonal Easter cold, we watched unbelievably as the base chaplain blithely set his two big pulpit flags down on either side of the visiting minister's microphone, just before we went on the air. The wind was blowing in sharp gusts and those two flags snapped and popped like blank cartridges on a sound stage. We wouldn't have been surprised if the listeners had thought we were machine-gunning the preacher—who really wasn't that bad!

Our tribulations at Craig were made

(Continued on page 64, col. 1)





## THE BATTLEFIELD'S

# *Feathered Couriers*

By Major Otto Meyer

Chief of the Signal Corps Pigeon Breeding and Training Center  
Fort Monmouth, N. J.

That feathered messenger, the pigeon, who has been playing the role of courier since the days of Solomon, still maintains his place in the Army communication system. Despite miracles of communications and electronics developed and used by Signal Corps technicians, there are times when radio silence is required; there are times when machines fail, when wires cannot be strung, when installation of equipment cannot keep pace with the advance of troops. Then the Signal Corps turns to the faithful pigeon and asks him to serve in a role he has held for hundreds of years.

### **Selected Birds**

Virtually every message entrusted to a pigeon in World War II was delivered. With this record of flight performance under the most hazardous conditions of battle and weather, in fog and storm, the pigeon has earned his right to a place in today's Army. At the Signal Corps Pigeon Breeding and Training Center, Fort Monmouth, a "cadre" of a thousand pigeons is today's nucleus of this winged force should another emergency arise. The size of this force would depend on the need. In World War I about 15,000 birds were used and in World War II some 54,000 birds.

The pigeons at Fort Monmouth are not just a flock of anonymous birds; rather they are carefully selected and trained. There are oldsters in the lofts, veterans of the wars with feats of heroism in their records, and youngsters untried in battle but with known ability in performance of duty. All

young birds undergo a preliminary screening test to determine whether or not they have the desired physical qualifications which include weight, body conformation and richness of plumage. Final selection, however, is not made until the birds have been sufficiently tested during training flights and in races conducted by the civilian pigeon associations. Reliability, speed and endurance are the main factors in selecting a number of outstanding birds for breeding purposes. Feathered recruits also have been tested in large-scale maneuvers—the Army's peacetime proving ground.

Signal pigeons are used by patrols, scouts and agents in back of the enemy lines. Special pigeon parachute equipment is used in dropping the pigeons to the agents and isolated groups. The pigeon is customarily utilized when mechanical communications fail, but he is especially useful as a supplementary means of communication when other routes are overtaxed.

In the North African campaign, for example, requisitions for ammunition were sent by pigeon, with delivery accomplished 24 hours faster than through the overcrowded communications chan-

While pigeon message delivery is not strictly within the scope of the AFCA field of activity, even though some theorists believe that the birds' sense of direction is affected by electronic impulses, the pigeon has proved itself, even in an age of vast advances in electronic communications, to be invaluable as a messenger in emergencies, and the history of the "feathered courier" is interesting.

There are numerous facetious stories about the pigeon message carrier, especially the cross-breeding kind of story. One of the oldest of these has the pigeon cross-bred with an owl to produce a bird which will deliver night letters. Others tell of cross-breeding with woodpeckers to produce hybrids which will knock at the door when delivering a message; with parrots for spoken messages; and with canaries for singing telegrams.

But there have been many critical situations when much depended on the "feathered courier" getting the message through, and to those acquainted with the circumstances of those incidents the carrier pigeon holds an honored place along with other heroes of the battlefield.

Now retired at Fort Monmouth is the pigeon that carried the first news to Corps Headquarters in North Africa revealing the surrender of the 10th and 15th Panzer Divisions. He flew a distance of 65 miles in 82 minutes, ar-

Following is the text of a speech delivered by Brig. Gen. K. B. Lawton, Deputy CSO, at the 39th annual convention of the American Racing Pigeon Union.

It would be nice if all of the Army's procurement problems were as easily solved as are those involving pigeons. The pigeon problem hardly exists because of the generosity of American fanciers who, during the last emergency, responded with literally thousands upon thousands of their birds.

In World War II, the Signal Corps furnished 54,000 pigeons. Of those 54,000 pigeons, American fanciers furnished 40,000 to the Signal Corps through voluntary donations. They were given when the need was critical. You fanciers even helped to band the youngsters, because our own facilities were not adequate to meet the sudden demand that was thrust upon us. We remain grateful. And we are happy to be able to say that half of the birds so generously offered in



iving with the message ahead of all other means of communication.

Normally all written messages are in code, inscribed on a tough thin paper for lightness. Many overlays or sketches may also be transmitted by pigeon. The material may be in the original or in the form of microfilm with the message placed in a capsule attached to the pigeon's leg. A larger capsule for carrying more bulky messages, maps and photographs has been carried on a pigeon's back and has proved successful on short flights.

Vital messages are usually sent in duplicate, using two pigeons to insure delivery. When used in the field by the military, the pigeons are delivered to the message centers where they are either picked up by the using organizations or delivered by Army mail facilities to the units requiring them.

### Wartime Carrier Feats

Some of the veteran birds are as esteemed in the pigeon fanciers' world as any other heroes of the battlefield. High on the list is G. I. Joe who is credited with saving the lives of hundreds of troops at Colvi Bocchi, Italy. This pigeon flew 20 miles in approximately 20 minutes carrying the request to cancel the scheduled bombing since a British brigade had entered the city in advance of expectations. If G. I. Joe had arrived a few minutes later, it might have been a different story. In 1946 G. I. Joe was awarded the Dicken medal by the Lord Mayor of London.

Other veterans of World War II in-

Wartime use of carriers in the field, South Pacific 1944.



Larger capsule, for bulkier messages, carried on back, has proved successful on short flights.

### Lawton speech, cont.

their country's service were returned after the emergency. Several thousand more could have been returned, but no longer were desired by the former owners.

If there is another emergency, I am sure we will be calling upon you again; and I am equally sure the response will be as generous in the future as it has been in the past. Pigeons being the individualists that they are it is a little difficult to keep the population of the Pigeon Breeding and Training Center at Fort Monmouth, New Jersey, at the exact strength determined by the Army—but we try to keep it around one thousand. Since we used 54,000 in World War II and around 15,000 in the First World War, you can see why the Army wants to keep on the good side of you fanciers.

Whatever it is that brings a pigeon home—and in a few moments I will mention some of the Signal Corps efforts to find out what it is—we know that the birds served well during the last war throughout the world, wherever American troops went and sometimes where only small bands engaged in highly secret missions could venture.

We in the Signal Corps are pretty proud of the miracles of communications and electronics that rise from the test tubes and drafting boards of our laboratories, but there are times when radio silence is required so that the enemy does not know of our presence, there are times when machines fail, there are times when wires cannot be strung, when radios cannot be installed as quickly as our troops move forward. Then we fall back on the faithful pigeon and ask him to serve in a role he has held for thousands of years. Nearly every message entrusted to a pigeon in World War II was received.

Between wars, we have time to try to find out what makes pigeons tick, or more specifically, what makes them come home. The Signal Corps has sponsored research by Dr. Henry L. Yeagley at Pennsylvania State College. Dr. Yeagley believes that two things, primarily, bring a pigeon back to his home loft: one is the effect of flight through the earth's magnetic field; the other is the effect of the earth's rotation in conjunction with flight, producing side-slip. This suggests that the bird is affected both electromagnetically and ocularly. Birds raised and trained on one line of uniform electromagnetic effect become familiar with it and are able to return to it when displaced. Birds trained at a given latitude can detect a difference when released north or south of their home since the side-slip will be less or greater than that to which they are accustomed. We have been able to confuse birds by placing magnets on their wings. These studies indicate that pigeons could be mobilized and trained during an emergency in friendly areas containing magnetic and side-slip factors coordinate with certain enemy-controlled regions. Some time in the future, then, should we occupy those regions, the specially trained birds would in a sense already be "at home." A few short flights to learn local landmarks could complete their training, and they could be put to work in short order.

Work also has been done at the New Jersey Agricultural Experiment Station, at Rutgers University, to study the effects of diet. Research already has disclosed a great difference in the homing performance of pigeons fed a standard racing diet, as compared with those fed a squabbing ration.

Another interesting investigation has been conducted at Fort Sam Houston, Texas, in collaboration with the United States Air Force. Tests were run with pigeons in a decompression chamber, to find how the birds would react at 25,000 feet. After each bird was confined in the chamber a few minutes, it was released to return to its loft, about 10 miles away. All the birds utilized in



cluded Jungle Joe who, when four months old, was parachuted to agents behind enemy lines in Asia. He carried vital information to headquarters 225 miles away over some of Asia's highest mountains. Burma Queen, then five months old, also was parachuted behind Japanese lines and flew 320 miles over mountains in nine hours to carry a message that brought relief to an isolated band of men. Blackie Halligan, a veteran who died in 1948, carried a message from the 164th Infantry on Guadalcanal revealing the position of 300 Japanese troops. Blackie was severely wounded but, true to tradition, he got the message through.

The use of pigeons in war is no innovation for they have been so used since the siege of Troy. During the siege of Paris in 1870-71 the Germans recognized their value to the besieged and trained hawks to intercept them. The Paris pigeons revived interest in the utilization of the birds for military and naval purposes, with the training activities centering largely in Belgium.

### **Pigeon Company T.O.**

An Army signal pigeon company consists of nine officers and 149 enlisted men. This includes 108 enlisted pig-



The author, Major Otto Meyer.

#### **Lawton speech, cont.**

these tests were previously trained and experienced racers. All appeared confused and reluctant to fly, with some landing on the ground and some on buildings. All eventually returned to the home loft, but an unreasonable length of time was required. This experiment coincides with the experience some of you may have had, of disastrous results when pigeons are shipped by air to race points. If air facilities are used, it may be necessary to give birds a rest of two or three hours before being released, in order to allow the blood oxygen saturation to become normal.

Some interesting observations on the effect of climate on pigeon-handling came out of the China-Burma-India theater during the war. When the monsoon brought heavy rains and driving winds, canvas strips were placed over loft section joints on both roof and sides. Fourteen-inch eaves were built above all windows. The lofts were placed under shade trees to avoid the intense heat and accompanying humidity, which retarded breeding activities. Since termites would destroy any wood touching the ground in a matter of hours, the lofts were raised 12 inches from the earth on a foundation of creosote bricks. Despite the change in climate, an unusually high vitality was maintained among the birds. Among youngsters, the rate of growth was more rapid than normal because of the heat.

I want to mention one other experience of the recent war. This was in the Mediterranean Theater of Operations. It is a brief report, a single paragraph dated 30 April 1945:

"The use of carrier pigeons by the engineer water supply battalion in this theater has been a great factor in the successful water supply operations. The battalion commander has indicated that distant water points normally with no means of communication with company or battalion headquarters except by truck or messenger over miles of rough and sometimes impossible mountain roads, have been able to transmit urgent requests for supplies and parts, as well as daily operations reports to the proper headquarters in an hour's time. This has also resulted in great saving of tires, vehicles and personnel."

What more appropriate than that this ancient friend of man should help man to obtain one of the sources of life itself—water?

So in closing, on behalf of the Chief Signal Officer of the Army and myself, let me repeat and assure you that there is a very definite requirement for the winged carriers of messages for our nation's defense. Although the Department of Defense cannot participate in any situation where limiting or prohibitory regulations might be proposed by some municipal community, we do want to emphasize that if it were not for the civilian pigeon fanciers of this country the requirements for our military operations could not be met.

We are happy to know that the racing pigeon fanciers of this country are ready to respond and will meet any requirement they are called upon to meet.

coneers in addition to company clerks, supply men, cooks and supporting personnel. The Surgeon General supplies each pigeon company with one veterinary officer and three enlisted assistants. Each pigeon company has 4500 pigeons—900 for breeding purposes, 3600 for communications purposes. The breeder pigeons are consolidated into a breeder platoon and the balance of the birds are prorated to three combat platoons. A platoon consisting of four combat sections is normally assigned to division, corps or Army headquarters. A combat section has five pigeoneers including one corporal.

### **Types of Lofts**

The Signal Corps pigeons are housed in lofts of three types. Permanent lofts are mainly located at the pigeon breeding base. Portable breeding lofts are normally used by the Signal pigeon companies. These lofts are seldom moved and are maintained in close proximity to Army headquarters.

A third type, the mobile combat loft, is maintained on a quarter-ton trailer and is towed by a jeep. This loft is stocked with young birds and is moved each day to a new location where the youngsters are given flight exercises to strengthen their wings. This procedure is known as mobilizing the pigeons. The mobile combat loft is generally stabilized in a given spot after a period of two or three weeks and youngsters are

(Continued on page 60, col. 1)



# ASSOCIATION AFFAIRS

## ARMED FORCES COMMUNICATIONS ASSOCIATION

1624 Eye Street, NW, Washington 6, D. C. Phone: EXecutive 6991

### DIRECTORS AT LARGE

Theodore S. Gary (1950)  
Dr. Lee De Forest (1950)  
Thomas H. A. Lewis (1950)  
Thomas A. Riviere (1950)  
Fred R. Lack (1951)  
Darryl F. Zanuck (1951)  
A. W. Marriner (1951)

C. E. Saltzman (1951)  
Leslie F. Muter (1951)  
William S. Halligan (1951)  
William C. Henry\* (1951)  
E. K. Jett (1952)  
Jennings B. Dow (1952)

Carroll O. Bickelhaupt (1953)  
Thomas J. Hargrave (1953)  
R. Adm. Earl E. Stone (1953)  
J. R. Cunningham (1953)  
Walter Evans (1953)  
W. G. Eaton (1953)  
Paul Goldsborough (1953)

### OFFICERS

**President:** Fred R. Lack\*  
**1st Vice-Pres.:** Theodore S. Gary\*  
**2nd Vice-Pres.:** Thomas J. Hargrave\*

**3rd Vice-Pres.:** R. Adm. Earl E. Stone  
**4th Vice-Pres.:** J. R. Cunningham  
**5th Vice-Pres.:** Carroll O. Bickelhaupt

**Past President:** David Sarnoff  
**Counsel:** Frank W. Wozencraft\*  
**Executive Secretary:** George P. Dixon\*

\*Executive Committee Member

## AFCA Annual Meeting May 12-13, New York, Fort Monmouth

### Harrison To Be Speaker

With final arrangements rounding out for the 1950 AFCA National Convention, New York and Fort Monmouth, May 12-13, it was announced by New York Chapter President Thompson H. Mitchell that the principal speaker for the Friday 12th banquet will be Major General William Henry Harrison, president of the International Telephone and Telegraph Corporation.

The obtaining of General Harrison as principal speaker for the meeting is regarded, especially among communicators, as especially felicitous. With his over forty years of experience in communications, ranging from repairman and wireman to the top post of a leading corporation, the I T & T president has a thorough familiarity with all phases of wire communications, and in addition is well acquainted with government operations in national defense, having served in various leading posts from 1940 until after the war.

Meanwhile the Fort Monmouth convention committee has prepared the printed program for its day, the 13th, in which they tell you, the convention visitor, that that day at Monmouth is going to be one of the most eventful, entertaining, and instructive days of your life! It's going to be your day, says the program, with the facilities of one of the most famous military and

scientific centers of the world at your disposal.

And so—the meeting dates will soon be here now. If you haven't got that reservation made yet better do it *now!*

See you at New York and Fort Monmouth.

### CCAFA

Recently appointed members of the Secretary of Defense's special committee on industrial relations were guests at the Coordinating Committee of Armed Forces Associations' monthly luncheon meeting in March at the Army-Navy Club in Washington, D.C.

Rear Admiral Louis Dreller, USN, Office of Naval Material; Colonel Charles M. Eisenhardt, USAF Public Relations; and Captain Robert M. Sullivan, U.S.A. (for Colonel George V. W. Pope, U.S.A.) representing the three major armed services for Secretary Johnson's industrial committee, discussed with the CCAFA members the matter of industry, armed forces national meetings, based on the experiences of the Industry-Army conferences which have been held yearly since the end of world war II. The latest of these conferences was the meeting in February this year at New Orleans. The previous meetings, all highly successful and well attended had been the first at Chicago in 1947, the second at Dallas in 1948, and the

third at Boston last year. Equally successful regional meetings were also held.

Several suggestions, some of which will likely be acted on, were advanced by the Defense Department industrial committee guests. Admiral Dreller expressed a strong conviction that any future military-industry meeting should include all armed services, since such combined meetings would better serve the unification spirit.

Some of the CCAFA group expressed the opinion that if a combined meeting were attempted, a gathering place could not be found which would be large enough to accommodate at one time all of the people who would want to attend. Colonel Eisenhardt suggested as a solution to the space problem the possibility of holding on the same day several meetings at different key population centers, instead of the single large meeting at one city. This proposal met instant approval by all present at the luncheon gathering. There being no other solution thus far suggested it is expected that plans will be advanced based on Col. Eisenhardt's thought.

The CCAFA meeting opened with an officer of each association outlining, at the suggestion of the coordinating committee's chairman, Colonel Leo Codd, the background and purposes of his own particular association, for the



The original purpose of the Armed Forces Communications Association in organizing, and its continued mission thereafter, was recently stated by the association's president, Mr. Frederick R. Lack, in terms which make probably as thorough an explanation of the association and its mission as could be presented. The statement in part was as follows:

*In the first half of this century we have been in two big wars. They were different than previous wars because in far greater measure than ever before, supremacy in science and industry was necessary to victory. We learned in the first world war that if we were to be prepared for defense or win a future war then our science and industry would have to be prepared fully as much as our armed forces. We thought about this a lot in the 20's and 30's but actually did little or nothing constructive about it.*

*The second of the big wars brought home to us that we could no longer merely THINK that science and industry should be included in preparedness—they HAD to be. We learned that, in order to accomplish this we had to have a partnership of officers and men of the military and civilians in industry which would serve to continue in peacetime the working cooperation achieved in wartime.*

*Simply then, that was the basic idea of our Association founders—a military-civilian partnership, with emphasis on the particular field of communications-electronics-photography. (We say field in the singular because we believe that the three areas of our interests are not divisible.)*

*I should like to emphasize, while speaking of our military-civilian partnership, that we want to make this a real partnership, with no emphasis on one member than the other.*

The Armed Forces Communications Association in its present form was organized in May of 1946. It has had antecedents in organizations formed after each American war, going back as far as the Civil War. These persisted as individual posts, or as chapters, but they were never built up on a national scale with a national headquarters, as is the present AFCA. With one exception they more nearly resembled veterans organizations than military-industrial formations. The exception was the American Signal Corps Association formed after World War I. It did not last as originally organized because as Mr. Lack has pointed out, the necessity for a continuing military-industrial partnership was not fully understood until World War II. That the need is now thoroughly realized is evidenced by the determination and activity of the present association.

The Armed Forces Communications Association has presently approximately 6000 members, including about 125 industrial group members. The membership also includes virtually all top level personnel, military and industrial, in the communication-electronics-photography field.

Most of the members belong to chapters, which number 30 and are for the most part in the larger United States cities from coast to coast. There are also a European Chapter and a Far East Chapter, each with several sub-posts. Their membership is made up of occupation personnel, military and civilian.

In addition to the foregoing there are six ROTC chapters at universities formed among students taking electronic and communication courses. Interest is growing rapidly at many colleges and universities and it is expected that this year will see a considerable increase in ROTC chapters.

All chapters meet frequently, many of them monthly, and at these meetings discuss, in addition to their chapter business, association affairs which include the mission of the organization as outlined above. The chapter meetings often have military guest speakers who discuss, in talks before the members, national security problems, especially those concerning industrial and scientific preparedness in the association's special field of interest. Chapter meetings often include visits to nearby military installations where the progress of military developments is viewed and studied.

The association holds a national meeting each spring, which also includes a visit to one of the larger military installations. These meetings alternate between the three major armed services, the one this year being held at the Signal Corps post, Fort Monmouth, N. J., last year at Naval installations in and near Washington, D. C., and the year before at Wright-Patterson Air Force Base.

In its day-to-day operation directed toward furthering the mission set for itself, the association acts as a liaison between the military and industry.

The association's national headquarters staff attempts to keep abreast of research and development carried on by each of the components of its military-industry partnership. Information gathered is disseminated to all members by means of individual answers to requests for information, through news letters, and generally by the association's publication SIGNALS.

SIGNALS aims in make-up at the professional standard of the better commercial magazines. And rather than merely voicing the association's views, the publication attempts to contain matter which will be of interest to all readers in the association's specific field of interests. That it is more than moderately successful in this attempt is borne out by the considerable praise it receives from readers. The readership includes virtually all top figures in the field it serves. Since its beginning the publication has been published bi-monthly. The association plans to publish it monthly in the future.

benefit of the visiting guests. AFCA's Executive Secretary, George P. Dixon, made the presentation for our association. At the conclusion of all the presentations, Admiral Dreller requested that detailed accounts of histories and present activities be written by each association and mailed to him. The AFCA's account of its own operations,

written in compliance with the Admiral's request was duplicated and copies have been sent to each of our group members.

### Armed Forces Day

Supplanting the various days set aside to honor the armed services in-



Another batch of SIGNALS returned—no change of address given.

### Addresses Unknown

Copies of SIGNALS mailed to the below listed members have been returned to us because the latest addresses we have for these names are incorrect. If you know the present address of any of these members please jot it down on a post card and send it to us.

Lt. Ralph E. Anderson  
Pvt. Samuel R. Ballard  
Pvt. Lyndon B. Bledsoe  
Glenn G. Button  
John A. Casey  
Capt. Douglas S. Fralick  
Capt. Arthur M. Fredenburg  
Ralph Fullwood  
Maj. Elmer R. Higgins  
J. Leonard Hogg  
Sgt. Herbert L. Holt  
L. R. Honts  
James B. Kerr  
SFC Masayuki Kiyota  
Pfc. Stanley C. Logan  
Hiter H. Lowry  
Maj. Homer L. Marcy  
Sgt. Charles A. Montague, Jr.  
James K. Morrow  
James T. Nash  
1st Lt. John M. Panek  
Major J. B. Prestridge  
Dewey D. Puckett  
Cpl. Albert Riggs  
M/Sgt. Howard V. Rooney  
Sgt. Alfred W. Schoenfelder  
Cpl. Isaac Stephens  
Rct Nolan C. Todd  
A. B. Vasquez  
Maj. Bernard K. Ware  
1st Lt. Richard J. Winn

dividually, the first Armed Forces Day has been designated by the Secretary of Defense and approved by the President for May 20th.

Armed Forces Day is visualized as a day of mutual get-together wherein the armed services will give an accounting to the nation of its progress and status and the nation will pay tribute to those who have served and are continuing to serve. The AFCA hopes its members will fully participate in this cooperation.

The Signal Corps Center at Fort Monmouth is making the week preceding May 20th Armed Forces Week. The week will open with the AFCA meeting, May 13th, and will close with the Armed Forces Day observance a week later.



## ASSOCIATION AFFAIRS

*Copies of the correspondence published below have been sent direct to all chapter presidents. However, we believe that the items discussed in these letters between the AFCA Executive Secretary and the Pittsburgh Chapter president will be of interest to many of our members. The first of the letters which follows was a letter sent from National Headquarters to each chapter president. The reply from the Pittsburgh Chapter is a good example of a constructive study based obviously on thoughtful consideration of the problems brought up for discussion in the original headquarters letter.*

March 2, 1950

Dear Mr. Staubitz: (President, Pittsburgh Chapter)

Plans are now well under way for the fourth annual convention of the AFCA and it is time that we were all seriously thinking over the many important items that should come up for discussion during the morning and afternoon business sessions. The morning session of the Council and Board of Directors will, of course, be taken up with discussion and action on general association matters, whereas the afternoon chapter presidents' conference will have for consideration many items which are particularly of interest to the chapters themselves.

I hope that we can make this chapter presidents' conference the main business event of our annual conventions. The life and growth of the association lies in the strength and activity of its chapters and I feel that it is one of our prime duties here at headquarters to do everything possible toward increasing the effectiveness of the various units of our national organization.

Following is a tentative list of subjects I have jotted down for possible consideration at the chapter presidents' conference. I would appreciate it if after looking this list over you or additional items which you may have in mind for discussion would send me, as soon as possible, any suggestions, changes.

1. Revision of national constitution and by-laws.
2. Advisability of change in name of association and magazine.
3. Cost of SIGNALS and question of publishing monthly—(possibility of raising dues to \$6.00 to cover twelve issues).
4. Reduction of classes of membership to Group, Full and Student—eliminating associate and retired fees (perhaps increasing student to \$3.00).
5. Use of standard chapter stationery and envelopes.
6. Assignment of some members-at-large to chapters; extension of chapter areas.
8. Types of successful chapter meetings.
9. Chapter constitution and by-laws.
10. Chapter officers and committees.

I hope that we shall have present at least one representative from each active chapter in the AFCA. If not the president of the chapter, then someone he has designated as his representative. Perhaps the secretaries and some other officers and directors of the nearby chapters will also be able to attend this important meeting.

Let me hear from you soon and write me about any other local problems you may have.

Sincerely,  
/s/ George P. Dixon  
Executive Secretary

March 16, 1950

Dear Colonel Dixon:

The reason for the delay in replying to your letter of March 2 is entirely due to the desire on my part to present it to the membership of the Pittsburgh Chapter at our monthly meeting. Our monthly meeting was held last evening, March 14, and the various subjects mentioned in your letter were openly discussed. The results were rather surprising in that it developed into one of the most active meetings that we have had and I believe you will be interested in the following report of these discussions.

There were no comments concerning the revision of the national constitution and by-laws.

There were no comments concerning the advisability of change in name of the association and magazine.

Considerable discussion developed in connection with the cost of SIGNALS and the possibility of its becoming a monthly publication. There was definitely no objection to the raising of dues to \$6.00, everybody feeling that it would be well worth the price if SIGNALS was published on a monthly basis instead of on the present schedule. Many of the members were highly enthusiastic about this publication, some of them indicating that material they have obtained from this magazine has been available to them through no other source. It was unanimous that it be moved up to a monthly basis.

While on the subject of the magazine, a suggestion was made that through this medium, group membership might possibly be increased. It was suggested that if this magazine undertook to publish brief articles concerning various organizations and their products and showed how they were used in military activities, it would provide these organizations with a certain amount of national publicity. We fully appreciate that people regularly producing finished equipment for use by these services have the regular mediums of publicity. Secondary organizations, such as the steel companies play an indirect but rather large part in the supplying of this equipment through the medium of supplying raw materials which are finally used by the processors and fabricators of the respective items. It was felt that on this basis of approach interest could be aroused and possibly result in favorable action by companies that may be one or two or even three steps removed from the actual finished items.

The cost of an annual group membership is negligible as compared with the annual advertising cost of these large organizations and it appeared to us that such a proposal would be attractive to them and might induce them to support the organization on a financial basis if not actively participating in the affairs of the local chapters.

Carrying the thought still further it appears that the initial approach could probably be made from Washington to establish in the minds of these larger companies that the organization is national in scope and the final or further contacts could then be made by members of the local chapters.

While on the subject of group membership, comments were made on the methods used by the national organization with reference to the distribution of the annual dues. The impression prevailed that the chapter's share of the annual assessments were returned to the chapter having jurisdiction over the area from which the registration and dues were paid. These group memberships that were national in scope naturally had members in various localities who became members of the local chapters. It was suggested that a fairer distribution of the chapters' share of the annual assessments should be prorated to the various chapters based on the membership of these companies in the local chapters.

Another question raised by one of the members concerned advertising by the national body in magazines circulated through the communication and radio fields. The magazine QST was mentioned as one magazine which has extensive circulation especially through the amateur radio relay league which should be in a position to establish membership in our organization.

Definite objections were registered to increasing the student fee. Incidentally, none of the members present were students and, therefore, had no personal interest in such an attitude. They all felt, however, that at best student funds are as a rule rather limited and that a 50 per cent increase would cause a substantial loss in membership which would be highly undesirable.

In discussing the next item concerning stationery and envelopes, the discussion was confined largely to the present and past secretaries of our chapter. They did not appear to be particularly interested in obtaining a supply of stationery and envelopes but the following suggestion was made. It was suggested that national headquarters prepare from the stencils that they have approximately 12 gummed labels containing the names and addresses of all registered members for each local



## ASSOCIATION AFFAIRS

Hams should be particularly aware of Armed Forces Day, May 20th, since a receiving contest like that which was held for so long on Navy Day, and a QSO and message-relay contest, will be open to all amateurs. A greeting to hams will be broadcast by the Secretary of Defense over 13 military frequencies from Navy radio station NSS and Army radio station WAR in Washington, D. C., and from the Navy station NPG at San Francisco.

### Photo Contest Coming Up

#### Result Of Tour By ROTC Chief

Plans for a photographic contest to be sponsored by SIGNALS have been set in motion as a result of a recent tour by Lt. Col. Wayne P. Litz, Chief of ROTC Affairs, OCSigO, in which ROTC units at universities west of the Mississippi were visited.

Dropping in at AFCA National Headquarters after the end of the six weeks tour, near the end of March, Col. Litz reported that he had met with strong student interest in the AFCA and SIGNALS. The comment, as relayed by the ROTC affairs chief, was highly interesting to National Headquarters and is sure to prove useful in the formation of additional student chapters and in the



Col. William W. Jervey (left), long familiar to AFCA members as director of the Army Pictorial Service, left the U. S. for a new post in Germany about April 1st. He had been chief of the pictorial branch since Sept. '45. Col. Charles S. Stodter (right), who as C.O. of the SigCorps Photo Center, Long Island City, was to have been host to AFCA convention visitors May 12th, has replaced Col. Jervey in the Pentagon. The new C.O. of the Long Island center is Lt. Col. Wallace W. Lindsay.

chapter. It was pointed out that the typing of the names and addresses on postal cards containing notices of meetings, etc., has developed into a major job which develops into somewhat serious proportions if the secretary does not have available the time and equipment necessary for filling in these addresses.

The assignment of members-at-large to chapters raised a question that none of the members appear to have very much information on. Under these circumstances they had no comments concerning this question. The question of extension of chapter areas, however, brought forth some discussion and brought forth a very strong "no" until more information is available on just what is proposed.

The next question concerning expansion in the number of large and small group memberships caused some discussion. It all focused down to one point, however, which indicated that more aggressive action on a national basis would be the most effective. We felt that the proposed write-ups previously discussed under the question concerning SIGNALS would be a definite inducement to organizations at the levels below the completion stage offers good possibilities.

Question 8, 9 and 10 brought forth no particular comments of interest.

It was suggested that in correspondence addressed to and from retired officers on the inactive list should not be addressed by rank title. Personally, I do not know what may have inspired these comments but from the reaction of several of the members who are undoubtedly included in this group, it would be my suggestion that such a procedure be adopted.

It was also suggested that the national headquarters provide the local chapters with some kind of a standard form which could be used for briefly reporting the chapter meetings. The space at the top of the sheet should be printed so that it would be possible to fill in the date, chapter name and the attendance at such meetings with space below for briefly reporting the activities that took place.

I believe that after reviewing the above you will agree that we enjoyed an extremely active meeting.

Very truly yours,

/s/ E. J. Staubitz

President, Pittsburgh Chapter, AFCA

March 20, 1950

Dear Mr. Staubitz:

Thanks very much for your letter of March 16th. It is one of the most interesting and constructive replies I have had to the letter which was sent to all chapter presidents on March 2nd. Your idea of building the Pittsburgh Chapter monthly meeting around a discussion of the proposed agenda was unique so far as I know and the results were not only surprising but to me very worthwhile.

In answering, I would like to take up the points in the order in which they appear in the agenda and in your letter.

1. Revision of national constitution and by-laws. There are several conflicting items and others entirely omitted from our present constitution and by-laws, and President Lack, Colonel Wozencraft (our counsel), and others have felt for some time that it is very important that they be revised. We have already worked up a draft which is being studied and revised before it is submitted to the national directors on May 12th.
2. Advisability of change in name of association and magazine. Personally, I dislike changes unless there is a real necessity for them. However, there is considerable conflict between the initials AFCA of our association which are also in use by the Armed Forces Chemical Association. One of us should certainly change our name. The suggestion of a change in the name of the magazine is merely something which deserves an open discussion among the chapter representatives.
3. Question of publishing SIGNALS on monthly basis—with increase in dues to \$6.00. Your chapter's decision that the magazine should be published monthly rather than bi-monthly is interesting because I have always felt that continuity was impossible in a bi-monthly periodical and also that we have enough material of importance to the members to publish SIGNALS on a monthly basis. For your information, some of the other chapters do not believe we should increase the dues even with monthly publication of SIGNALS. I have made a study of the exact cost to us of producing the magazine, and rent, salaries, printing, circulation department costs, mailing, stationery and



## ASSOCIATION AFFAIRS

maintenance of those already in existence.

Suggestions concerning SIGNALS were especially interesting, giving something of a gauge on student reader likes. Desire was voiced for more articles of the wartime "I was there" kind, not so much on command levels but more on the working level with accounts of the operations of various equipments; for articles on current exercises; and on the latest developments in equipments and devices in our especial field. Widespread and strong interest was expressed in the possibility of SIGNALS holding a photographic contest among ROTC students.

Such comment is just what SIGNALS constantly attempts to gather from its readers, so that it can be known what type of feature the reader prefers. Whenever such suggestions are received they will be used as a guide in preparing the publication, and that will be true of the ROTC comment. The photo contest idea is already being acted on. Plans are being drawn up, and will likely be rounded out and presented in the next issue. Tentatively it can be said that the first contest will be for student reserve members, and that a general contest will follow shortly thereafter.

Following are the universities and assistant PMS&T's for Signal Corps visited by Col. Litz. At several of these

## Position Wanted

Graduate of American Television, Inc., desires position as technician or engineer in broadcast or television studio. Bachelor of Science degree in television engineering. First class radio telephone operator's license. Electronics technician in Navy. Familiar with many and varied types of electronic equipment. Ambitious with good references. Please contact James Jiral, Jr., 1824 East Avenue, Berwyn, Illinois.

there are AFCA student chapters:

University of Arkansas, *Capt. F. M. Mosely, Jr.*; Oklahoma A&M College, *Capt. M. M. Berry*; Texas A&M College, *Capt. W. R. Blake*; Texas Technology College, *Capt. W. C. Neubauer*; University of Illinois, *Major B. W.*

other items pertinent only to the magazine, amount to approximately 50c per copy at the present time. Until it is possible to increase our advertising and circulation this cost will remain more or less fixed. You can see, therefore, that out of our regular \$5.00 membership dues, after \$1 has been returned to the chapter and \$3 spent on six issues of the magazine, we have only \$1 left (plus the dues received from our group members) with which to run this headquarters. Frankly, I find that the increased activity necessary to build the association to what it should eventually become from a national standpoint is very difficult without some additional income. Again, these points are something which must be placed before the members for a frank and open discussion.

Your suggestion regarding means by which group membership may be possibly increased is excellent and I have already had a discussion with Mr. Fingal, editor of the magazine, this morning who is enthusiastic about your ideas. Also the point concerning our advertising the association in magazines circulating through the communications or radio fields. That was something which we have already been discussing and hope to gradually get into as soon as it is financially feasible.

4. Reduction in classes of membership. I have noted your chapter's feeling in regard to agreement on the reduction in the classes of membership and also that the student membership should be retained at \$2. This again is an item which should be fully discussed before any final action is taken.
5. Use of standard chapter stationery. My thought in connection with the use of standard chapter stationery was merely that if chapters wish to have their own letterhead and envelopes (which a number of them do), it might be better if we adopted a standard type. Printing of a large amount of stationery here at headquarters would mean an overall saving.  
In connection with your suggestion regarding the gummed labels with names and addresses of all your chapter members, we already prepare envelopes for some of the chapters by having them run through the stencils maintained by our printer. It has been found more practicable not to stencil too many sets of envelopes in advance because of the continual changes in names and addresses. If you wish any of this work done for immediate use please drop me a line and we will be glad to take care of it. Generally we have had the prepared envelopes mailed directly to the chapter involved and deducted the cost from the chapter credit here at headquarters.
6. Assignment to chapters of some members-at-large (extension of chapter areas). My thought in connection with this item was merely that out of the approximately 800 members-at-large there must be some who are geographically near enough to one of our present chapters to be added to that chapter roster. They would then get notices

of chapter meetings and feel that they really belonged to a unit of the association even though it might not be possible for them to attend meetings more than once or twice a year. This also covers the thought of the possible extension of some chapter areas. This action would of course mean a dollar per member added to the chapter income.

7. Regarding the expansion in the number of our large and small group memberships. I believe that the very worthwhile suggestions contained in your discussion of item 3 cover this matter satisfactorily.
8. Types of successful chapter meetings.
9. Chapter constitution and by-laws.
10. Chapter officers and committees.

Although the Pittsburgh Chapter found nothing to comment on in items 8, 9 and 10, these are points which are of interest to some chapters and to us here at headquarters and I believe should be brought up for discussion at the annual chapter presidents' conference. For your information, I have added to my own copy of the suggested agenda the following items:

11. Student chapters
12. Sub-chapters or posts.
13. Chapter finances.

Your suggestion regarding a standard form to be provided local chapters for briefly reporting chapter meetings deserves further study and discussion. This is the first time such a suggestion has been made and if it would assist our various chapters in forwarding reports to us I am sure that it is very much worthwhile. In your case, for instance, we have had no report of a chapter meeting since October 1949 when the report was brought back to headquarters by General Sherrill who had attended that meeting. I take it from your letter that your chapter is actually holding monthly meetings. We are very anxious to include all possible chapter news in SIGNALS and you have probably noted that this section of the January-February issue has been much expanded. I am glad to have this suggestion and it is one which can well be added to our agenda.

In reading this letter over I see that I missed one other point you made. The use of a retired officer's rank is proper unless he asks that it not be used. A reserve officer's rank may be used according to regulations, if he so desires. Our correspondence is guided by this common usage. You will note that our letterhead and magazine only indicate rank in the case of regular officers still on active service. I feel that this matter is a personal one, that is up to the individual concerned and not one that this headquarters should attempt to dictate.

Thanks again for your fine letter. It really encourages me to receive a reply so full of constructive suggestions.

Sincerely,  
/s/ George P. Dixon  
Executive Secretary



Caron; Purdue University, Lt. Col. Norbert C. Miller; Iowa State College, Capt. Robert E. Dunlap; Kansas State College of A&AS, Capt. M. M. Price; Michigan State College of A&AS, Major P. S. Mellinger; University of Michigan, Major G. W. Shivers; University of Minnesota, Major W. M. Copley, Jr.; University of Wisconsin, Major Smith; University of California, Lt. Col. W. E. Heltzel; Oregon State Agricultural College, Lt. Col. R. L. Ostermeier; Washington State College, Lt. Col. D. J. Calidonna.

### Gaither Once More

We keep gloating over requests we receive for permission to reprint the "radio propagation and use of antennas" article by Lt. Col. Loren E. Gaither (SIGNALS July-Aug. '49) because we were regarded by some as having become loaded with an excess of enthusiasm upon reading the article in the original manuscript.

The reprint requests we receive, which were outlined in the last issue, we feel now justify our early enthusiasm. And we've had another, this time from the Swedish Military Review.

### Hold The Foam!

The Fifth Armored Division Association tells us that they will be holding their 1950 meeting July 13-14-15 at the Hotel Jefferson in St. Louis. What intrigues us is that on one of the days of the meeting the association will tour the Anheuser-Busch brewery. Seems to us that breweries must have some sort of communication systems, if only inter-office to tour, if you see what we mean, AFCA chapters!

### Utah State Agricultural College

A student chapter has just been organized at Utah State Agricultural College, Logan, Utah, with twenty-five charter members. The officers chosen to head the new chapter are: Marvin H. Stoneberg, president; Keith E. Taylor, 1st vice-president; John W. Petusky, 2nd vice-president; George L. Beutler, secretary; Robert S. Turley, treasurer; Devan Robins, asst. treasurer.

The chapter's sponsor is Captain Harold W. Christy, USAF, communications instructor.

**Plan Now to  
Attend the  
AFCA MEETING  
For 1950 at  
New York City  
and  
Fort Monmouth**

## AFCA GROUP MEMBERS

### Communications—Electronics—Photography

Listed below are the names of the American firms who are group members of the Armed Forces Communications Association. By their membership they indicate their readiness for their share in industry's part in national security. Each firm nominates several of its key employees or officials for individual membership in AFCA, thus forming a group of the highest trained men in the electronics and photographic fields, available for advice and assistance to the armed services on research, development, manufacturing, procurement, and operation in our special fields.

Acme Telecronix  
American Institute of Electrical Engineers  
American Phenolic Corporation  
American Radio Institute, Inc.  
American Radio Relay League  
American Steel & Wire Company  
American Telephone & Telegraph Co.  
Anaconda Wire & Cable Company  
Arnold Engineering Company  
Astatic Corporation  
Automatic Electric Company  
Automatic Electric Sales Corp.

Baltimore News Post  
Baltimore Radio Show, Inc.  
Barry Corporation, The  
Bell Telephone Company of Pa.  
Bendix Radio  
Bliley Electric Company  
Breeze Corporation, Inc.  
Burnell & Company

California Water & Telephone Co.  
Capitol Radio Engineering Inst., Inc.  
Carolina Telephone & Telegraph Co.  
Central Radio and Television Schools  
Chesapeake & Potomac Tel. Co.  
Cincinnati & Suburban Bell Tel. Co.  
Collins Radio Company  
Copperweld Steel Company  
Cornell-Dubilier Electric Corp.  
Corning Glass Works  
Coyne Electric School, Inc.

Diamond State Telephone Co.

Eastman Kodak Company  
Eby, Inc., Hugh H.  
Electronic Associates, Inc.  
Electronic Designs, Inc.  
Epsey Manufacturing Co., Inc.

Federal Mfg. and Engineering Corp.  
Federal Telephone & Radio Corp.

General Aniline & Film Corp.  
General Cable Corporation  
General Electric Company  
General Instrument Corp.  
General Telephone Corp.  
Gilfillan Bros., Inc.  
Gray Manufacturing Co.

Hallcrafters Company  
Haloid Company  
Hazeltime Electronics Corp.  
Heinemann Electric Company  
Hercules Motors Corp.  
Hoffman Radio Corp.

Ilex Optical Co.  
Illinois Bell Telephone Co.  
Indiana Bell Telephone Co.  
Indiana Steel & Wire Co.  
Institute of Radio Engineers  
International Resistance Co.  
International Tel. & Tel. Corp.

Jacobsen Manufacturing Co.

Kellogg Switchboard & Supply Co.  
Kleinschmidt Laboratories, Inc.

Lavoie Laboratories  
Leich Sales Corporation  
Lenkurt Electric Company, Inc.  
Lewyt Corporation

Machlett Laboratories, Inc.  
Magnavox Company  
P. R. Mallory & Co., Inc.  
Merit Coil and Transformer Corp.  
Michigan Bell Telephone Company  
Mines Equipment Company  
Motorola, Inc.  
Mountain State Tel. & Tel. Co.

National Carbon Company, Inc.  
New England Tel. & Tel. Co.  
New Jersey Bell Telephone Company  
New York Telephone Company  
North American Philips Co., Inc.  
Northwestern Bell Telephone Co.

Oak Manufacturing Co.  
Ohio Bell Telephone Co.  
O'Keefe & Merritt Company  
Operadio Manufacturing Company

Pacific Telephone & Telegraph Co.  
Philco Corporation  
Photographic Society of America

Radiart Corporation  
Radio Condenser Company  
Radio Corporation of America  
RCA Victor Division  
Ray-O-Vac Company  
Reeves Instrument Corp.  
Remington Rand, Inc.  
Rola Company, Inc.

Sherron Electronics Co.  
Smuckler & Company, Inc., A. F.  
Society of Motion Picture Engineers  
Sonotone Corporation  
Southern Bell Tel. & Tel. Co.  
Southern New England Tel. Co.  
Southwestern Bell Telephone Co.  
Sperry Gyroscope Company  
Stackpole Carbon Company  
Stewart-Warner Corporation  
Stupakoff Ceramic & Mfg. Co.  
Sylvania Electric Products, Inc.

Telephone Services, Inc.  
Telephonics Corporation  
Teletype Corporation  
Times Facsimile Corporation  
Tung-Sol Lamp Work, Inc.

United Radio Television Institute  
United States Rubber Company

Western Electric Company, Inc.  
Western Union Telegraph Co.  
Westinghouse Electric Corp.  
Weston Electrical Instrument Corp.  
Willard Storage Battery Company  
Wisconsin Telephone Company  
Wollensak Optical Company



# CHAPTER NEWS

*National Director of Chapters: Theodore S. Gary, 1033 W. Van Buren St., Chicago, Ill.*

## AREA REPRESENTATIVES FOR CHAPTERS

- Area A:** William H. Harrington, 195 Broadway, New York 7, N. Y. *New England States, New York, New Jersey*  
**Area B:** J. H. LaBrum, Packard Building, Philadelphia, Pa. *Delaware, Kentucky, Maryland, Ohio, Pennsylvania, West Virginia and Virginia*  
**Area C:** W. H. Mansfield, So. Bell T&T Co., Atlanta, Ga. *Southeastern States along Atlantic and Gulf coasts—from North Carolina to Louisiana including Tennessee*  
**Area D:** H. L. Reynolds, 1800 N. Market St., Dallas, Tex. *New Mexico, Texas, Oklahoma, Arkansas*  
**Area E:** T. S. Gary, 1033 W. Van Buren St., Chicago, Ill. *Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Kansas, Nebraska, North Dakota, South Dakota, Wyoming, Colorado*  
**Area F:** H. L. Hoffman, 3761 S. Hill St., Los Angeles, Calif. *Arizona, Utah, Nevada, California, Idaho, Oregon, Montana and Washington*

## CHAPTERS: PRESIDENTS AND SECRETARIES

- ATLANTA:** President—W. H. Mansfield, Southern Bell Tel & Tel Co., Hurt Bldg., Atlanta, Ga. Secretary—Dewey Allread, Jr., Bldg. 104, Apt. 1, Fort McPherson, Ga.
- AUGUSTA-CAMP GORDON:** President—Henry J. Hort, SCTC, Camp Gordon, Ga. Secretary—P. K. Jones, Southern Bell Tel & Tel Co., Augusta, Ga.
- BALTIMORE:** President—E. K. Jett, 3333 N. Charles St., Baltimore, Md. Secretary—Henry W. Williams, 3953 Cloverhill Rd., Baltimore, Md.
- BOSTON:** T. F. Halloran, General Communication Co., 530 Commonwealth Ave., Boston, Mass.
- CHICAGO:** President—Oliver Read, Radio News, 185 N. Wabash Ave., Chicago, Ill. Secretary—Raymond K. Fried, 111 W. Monroe St., Chicago, Ill.
- CLEVELAND:** President—Lee J. Shaffer, 320 Superior Ave., N. W., Rm. 205, Cleveland, Ohio. Secretary—T. F. Peterson, American Steel & Wire Co., 1434 Union Commerce Bldg., Cleveland, Ohio.
- DALLAS:** President (acting)—Warren S. Hatfield, Southwestern Bell Tel Co., Dallas, Tex. Secretary (acting)—Lury B. Redmond, 6106 Victor St., Dallas, Tex.
- DAYTON-WRIGHT:** President—Edward H. Bobzean, Ohio Bell Tel Co., 215 W. 2nd St., Dayton, Ohio. Secretary—Philip H. Johnson, 2028 Colonial Village Lane, Dayton, Ohio.
- DECATUR:** President—Robert C. McMurtrey, 2400 Kirby Court, Decatur, Ill. Secretary—Willard A. Hayward, 1289 N. University, Decatur, Ill.
- EUROPEAN:** President—Steve J. Gdler, USAFE, Chief, Electronics Supply, APO 633, New York. Secretary—C. E. Laurendine, Comm. Gp., Bipartite Control Office, APO 757, New York.
- FAR EAST:** President—George I. Back, Sig Sec, GHQ, FEC, APO 500, San Francisco, Calif. Secretary—Roy F. Blackmon, Sig Sec, GHQ, FEC, APO 500, San Francisco, Calif.
- FORT MONMOUTH:** President—J. D. O'Connell, 15 Allen Ave., Fort Monmouth, N. J. Secretary—Huston E. Maxwell, SigCorps Board, Fort Monmouth, N. J.
- GREATER DETROIT:** President—Robert J. McElroy, Michigan Bell Tel Co., 333 State St., Detroit, Mich. Secretary—Robert Derr, 20038 Pinehurst Ave., Detroit, Mich.
- KENTUCKY:** President—Robert H. McAteer, 1062 E. Cooper Drive, Lexington, Ky. Secretary—Clyde T. Burke, Lexington Signal Depot, Lexington, Ky.
- LOUISIANA:** President—Peter M. Miller, Jr., 1936 Robert St., New Orleans, La. Secretary—A. Bruce Hay, Southern Bell Tel & Tel Co., 520 Baronne St., New Orleans, La.
- NEW YORK:** President—Thompson H. Mitchell, RCA Communications, Inc., 66 Broad St., New York, N. Y. Secretary—David Talley, International Tel & Tel Corp., 67 Broad St., New York, N. Y.
- PHILADELPHIA:** President—W. W. Watts, RCA Victor Div., Camden, N. J. Secretary—Joseph Bergman, Sig Corps Stock Control Agency, 2800 So. 20th St., Philadelphia, Pa.
- PITTSBURGH:** President—E. J. Staubitz, 204 Tennyson Ave., Pittsburgh, Pa. Secretary—Sylvester C. Stoehr, Jr., 201 E. Main St., Carnegie, Pa.
- RICHMOND:** President—E. T. Maben, Chesapeake & Potomac Tel Co., 703 E. Grace St., Richmond, Va. Secretary—Lelia V. Fussell, Chesapeake & Potomac Tel Co., 703 E. Grace St., Richmond, Va.
- SACRAMENTO:** President—M. G. Mauer, 2320 Ralston Rd., Sacramento, Calif. Secretary—C. A. House, Sacramento Signal Depot, Sacramento, Calif.
- ST. LOUIS:** President—Charles P. Bohe, 5252 Nottingham Ave., St. Louis, Mo. Secretary—A. Reid Chappell, 70 York Drive, Brentwood, Mo.
- SAN FRANCISCO:** President—Harry E. Austin, RCA Communications, Inc., 28 Geary St., San Francisco, Calif. Secretary—William G. Damerow, 1625 Pacheco St., San Francisco, Calif.
- SEATTLE:** President—Clarence D. Lawrence, 5336 Hazel St., Seattle, Wash. Secretary—Clarence C. Bodine, 6812 Phinney Ave., Seattle, Wash.
- SOUTH CAROLINA:** President—Fred M. Fister, Southern Bell Tel & Tel Co., Owen Bldg., Columbia, S. C. Secretary—John A. Norman, 238 Waccamaw Ave., Columbia, S. C.
- SOUTHERN CALIFORNIA:** President—Arthur C. Hohmann, City Hall, Los Angeles, Calif. Secretary—Richard F. Walz, 5808 Marilyn Ave., Culver City, Calif.
- WASHINGTON:** President—Francis H. Engel, RCA Victor Div., 1625 K St., N. W., Washington, D. C. Secretary—Edward C. Cover, Chesapeake & Potomac Tel Co., 725 13th St., N. W., Washington, D. C.

## STUDENT CHAPTERS

- CORNELL UNIVERSITY,** Ithaca, N. Y.
- NEW YORK UNIVERSITY:** President—William A. Bocchino, 2007 Sedgwick Ave., University Heights, N. Y. Secretary—Robert E. Buckley, 2007 Sedgwick Ave., University Heights, N. Y.
- OKLAHOMA A & M COLLEGE,** Stillwater, Okla.
- STATE COLLEGE OF WASHINGTON,** Pullman, Wash.
- TEXAS TECHNOLOGICAL COLLEGE:** President—Thomas C. Penn, West Hall, Texas Tech, Lubbock, Tex. Secretary—M. G. Harris, Texas Tech, Lubbock, Tex.
- UNIVERSITY OF ALABAMA:** President—Butler P. Hine, Jr., PO Box 5305, University, Ala. Secretary—Emory W. Morris, PO Box 3009, University, Ala.
- UNIVERSITY OF CALIFORNIA,** Berkeley, Calif.
- UTAH STATE AGRICULTURAL COLLEGE:** President—Marvin H. Stoneberg, 290 N. 2nd E., Logan, Utah. Secretary—George L. Beutler, 133 E. Center, Smithfield, Utah.

NATIONAL HEADQUARTERS CHAPTERS SECRETARY: JULIA B. GODFREY



## Chapter Of The Year, 1949

### KENTUCKY

President—Murray P. McQuown  
Past Pres.—William M. Mack  
Secretary—Clyde T. Burke

### Augusta-Camp Gordon

The chapter's newly elected officers were installed at a dinner-dance at the Sheraton-Bon Air Hotel on January 20th. Seventy-six members and guests attended.

Hugh Fleming of Southern Bell Tel and Tel, retiring chapter president, briefly reviewed the circumstances surrounding the organization of the chapter, and related some of the highlights of the 1949 activity, before introducing his successor.

The new president, Lt. Col. Henry J. Hort, commanding officer of the unit training group at Camp Gordon, formally accepted office with a short address in which he paid tribute to the retiring officers and assured the membership that the new leaders will carry on, and attempt to expand the 1949 program throughout the coming year.

After the other new officers were introduced, the meeting was adjourned for a most enjoyable dancing party.

As SIGNALS went to press, the Augusta-Camp Gordon Chapter was still running in the lead in the "Chapter of the Year" contest which ends on April 30th. Its position is due to the excellent meetings which have been held regularly since its organization in April 1949 and to the highly successful membership drive which was launched in November and which is still bringing in results.

Augusta-Camp Gordon Chapter, Upper photo, dinner before dancing, night of officer installations. Lower: L to R at speakers' table, Lt. Col. Thomas K. Trigg, new vice-president, Col. Kenneth F. March, Mrs. Hugh Fleming, Lt. Col. Henry J. Hort, new president, and Hugh Fleming of Southern Bell Tel. Co. Mirth provoking quip unidentified.



Baltimore chapter meeting at Glenn Martin plant. L to R: R. W. Sanford, head of special weapons projects; John Pearce, electronics chief; and W. G. Purdy, project engineer—all of the Martin plant. C to R: Chapter Secretary Henry W. Williams; Col. Arthur M. Pulsifer, Second Army Signal Officer; George C. Ruehl, Jr., chapter program committee chairman; and chapter President E. K. Jett.

On March 3rd the chapter celebrated the 87th anniversary of the Signal Corps with a dinner-dance at the Camp Gordon Officers' Club. In keeping with the occasion, the principal address, given by Lt. Col. Royal S. Copeland, was devoted to a review of the history of the Signal Corps and current developments in Army communications.

Prior to the meeting, members availed themselves of the opportunity to review the exhibits and parade at Camp Gordon which marked the anniversary.

### Baltimore

On February 23rd, the Baltimore Chapter heard a talk on "Frequency Resources and National Policy" by Federal Communications Commissioner E. M. Webster. This was Commissioner Webster's second appearance before an AFCA chapter meeting this year, having addressed the New York Chapter on January 25th on the same sub-

### Chapter of the Year Contest

As of February 28th the following chapters were in the lead:

**Augusta-Camp Gordon**  
**Sacramento**  
**Fort Monmouth**  
**Chicago**  
**Southern California**  
**Cleveland**  
**Pittsburgh**  
**Atlanta**

April 30th marks the close of the contest. The winners will be announced at the annual meeting and will appear in the next issue of SIGNALS.

ject. Much interest was shown in his most timely and well prepared paper.

The meeting took place in the auditorium of the Pythian Building and was presided over by chapter President E. K. Jett of Station WMAR. He introduced Col. George P. Dixon, AFCA's new Executive Secretary, who spoke on "AFCA Present and Future." Col. Dixon stressed the objectives of the association and mentioned what many of the chapters are doing toward the expansion and development of the military-industrial team in communications, electronics and photography.

On March 22d the chapter demonstrated the interest built up under the leadership of President Jett, and former President Moran, by turning out for a meeting of record attendance under the handicap of having to drive several miles out of the city in a night of heavy rain.

200 members traveled through a steady downpour 12 miles outside of Baltimore to the Glenn Martin aircraft plant where they were guests of the Martin management for dinner and a discussion, illustrated with movies, on guided missile and rocket projects.

The Martin chief of electronics, John Pearce, welcomed the AFCA members





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and outlined the guided missiles program in general terms. The electronics chief said that it was confidently expected that a range of 4 to 5000 miles would soon be made practicable for guided missiles, and that they would be heat or acoustic sensitive and capable of self-guidance to certain points.

Prior to movies shown of the Gorgon IV ramjet projectile and the Viking rocket these developments were described by R. W. Sanford and W. G. Purdy of the Martin engineering department, and after the showing a question period was conducted by W. B. Bergen, chief engineer.

The chapter's new program committee is headed by George C. Ruehl, Jr., who has been associated with radio activities for almost 20 years. In 1939 he served as radio vocational instructor for the City of Baltimore. In 1942 he was named instructor-in-charge of the radio repairmen trainee program for the U. S. Army Signal Corps of the Third Service Command. In this capacity he was responsible for the development and supervision of a program for the training of approximately 350 Army reservists in radio maintenance.

He was commissioned a lieutenant (j.g.) in Naval communications at Harvard University. Subsequently he received special training in radio countermeasures at the Naval Reserve Laboratory, Anacostia, D.C., and was ordered to duty with the staff of the 8th Naval Fleet. He returned to the United States as a senior Lieutenant in July 1944 to report to the Chief of Naval Operations in connection with the effectiveness of countermeasures equipment. Later he was appointed assistant section head in the radio countermeasures section of the electronics division of the Bureau of Ships, Navy Department. While on this assignment he also served on the Joint countermeasures committee of the communications board of the Joint Chiefs of Staff.

Since being separated from active duty, Mr. Ruehl has resumed operation of his radio station as a member of the MARS radio net work.

### Chicago

The Automatic Electric Company, one of our AFCA group members, played host to the Chicago Chapter at its January 25th dinner-meeting. Mr. Charles S. Cadwell, president of Automatic Electric, welcomed the members and their guests and introduced the speakers.

Mr. C. F. Ffolliot, director of Automatic Electric's products design section, described "Automatic Toll Ticketing," tracing the development of the dial telephone systems with the A. B. Strowger step-by-step relay used in two-thirds of the world's dial phone systems. Latest development described was a completely operator-less installation about to start operation in Sundland, a suburb of Los Angeles, where a punched card system will give the final automatic touch with complete tickets to be billed to customers for their long distance calls.

Mr. Keith A. Regel, manager of industrial sales for Automatic Electric,



Members of the Chicago Chapter, AFCA and the communications section of the Western Society of Engineers at dinner prior to joint meeting in Chicago. Rear Adm. John R. Redman, Director of Naval Communications was guest speaker.

then gave an illustrated talk on "Adventures in Remote Control," showing wide applications of telephone type relays in such other fields as telegraph and radio operation, totalisator boards at race tracks, airplane propeller synchronization, and airport landing strip illumination.

A color film furnished through the courtesy of the U. S. Navy completed the program. Entitled "To the Shores of Iwo Jima," it showed the approach, bombardment, landing of Marines, and difficult fighting of one of the bitterest engagements of World War II.

The February meeting of the chapter was held as a joint program with the Western Society of Engineers in their clubroom headquarters in Chicago on the evening of February 20th. Chapter president Oliver Read presided together with Charles A. Huebner, chairman of the communications committee of the Western Society of Engineers.

Rear Admiral John R. Redman, Chief of Naval Communications, was guest speaker at the invitation of the AFCA, and talked on the use of high-power, low and very low frequencies in Naval Communications.

He traced the history of naval wireless communication from early developments in 1902, describing the use of German sets, and the first experiment between Annapolis, Md., and Washington, D.C., only 30 miles apart. By 1908, he said, the basic contributions of German inventors and Marconi, and AFCA Director Lee De Forest, had led to the equipping of 7 ships and 5 shore stations. A year later the first 100 KW transmitter was developed at Arlington, Va.

It soon became evident that the need for strong non-directional transmission would require use of low and very low frequencies, plus plenty of power. By 1918, the Navy was operating the most powerful station in the world, and the famous "Fourteen Points" of Woodrow Wilson were transmitted for the information of American troops overseas by the Navy station. Shortly thereafter, spark and arc systems became obsolete as the vacuum tube was developed. One vacuum tube 80 watt station built by the Navy in 1926 at

San Diego, California, gave good service through World War II, and was not dismantled until 1949.

Admiral Redman climaxed his talk with a description of the vast installation now being developed at Arlington, in the State of Washington, which will employ a 1000 KW transmitter, powered by 2500 KW from the Bonneville Dam of the Northwest's hydroelectric sources. The new installation ideally demands "flooring of an entire valley with copper," from the engineering viewpoint, an objective that will be approximated by the use of sheet copper roofing, copper foundations, and a network of wire. Admiral Redman closed with a paraphrase: "There are no frontiers we can not conquer."

George P. Dixon, AFCA's Executive Secretary, journeyed to Chicago to address the chapter on the subject of the Association's past, present and future. As a practical plan for building effective cooperation between the military and industrial organizations, he stressed the plan of establishing subposts or chapters throughout the United States. Defense-minded people in industry as well as Armed Forces personnel are a positive protection for the future, and our association is the natural liaison medium for developing mutual understanding and cooperation between these two groups.

### Cleveland

Continuing its policy of combining chapter meetings with inspections of local communications activities, the Cleveland Chapter visited the Ohio Bell Telephone Company on January 12th for a tour of its crossbar toll switching system.

Their February 9th meeting featured an inspection tour of AM-FM transmitter station WHK, television transmitter station WEWS, and television transmitter station and studio WXEL, Pleasant Valley.

### Far East

Despite the handicaps of a widely scattered area and a transient membership, the Far East Chapter is carrying out a program which is receiving



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Right: Top to bottom, Sacramento Chapter hears addresses by Brig. Gen. Shearer, Chief, P&D, OCSigO; Maj. J. B. James, Extc. O., ACS; Murle C. Schreck, Pres., Sacramento C of C; Col. Harry L. Vitzthum, CO, Sacramento Signal Depot; bottom, dinner at post restaurant.



the enthusiastic support of its entire membership. Activities are conducted by the four individual posts and are climaxed by an annual meeting of the entire chapter each spring. During a recent membership drive in which all posts participated, a total of 74 new members was secured as follows: Rycom Post—33; Philippine Post—25; Tokyo Post—16.

The following is a round-up of post news:

### Okinawa Post:

New officers were elected at a meeting held at the Ryukus Command Signal Office on November 25th. Col. Joy T. Wrean, commanding officer of the 97th AAA Group, was unanimously elected president. Other officers elected were: 1st vice-president—M/Sgt Doyle E. Morris, Rycom Signal Section; 2nd vice-president—Lt. Col. Clarence H. Lewis, commanding officer of the 529th AC&W Group; Secretary—Capt. J. A. Beauregard, personnel and administration division of the Rycom Signal Section; Treasurer—DAC Carl P. Dunkel, Rycom Signal Section.

Maj. J. W. Powers, outgoing chapter president, then introduced the Army and Air Force Military Amateur Radio System directors, and Capt. George H. Schmidt, of the 11th Signal Service Battalion, MARS director in Rycom, explained the proposed activities of his organization in the command.

The program was concluded with the film "The Battle of Okinawa."

On February 14th, members of the Okinawa Post toured the communication center of the Rycom Signal Section. After an explanation of visual screen teletype messages, the group sent and received messages to and from the Tokyo Post, AFCA.

Following this, visits were made to the ship-to-shore radio station, the center's terminal and relay section, the facilities control operations room and the Rycom telephone exchange.

The telecon demonstration was very successful and interesting to the Okinawan membership unfamiliar with the visual screen operation. The following officers were present on the Tokyo end of the demonstration circuit: Lt. Col. Roy F. Blackmon, secretary, Far East Chapter; WOJG William A. Schlick, treasurer, Far East Chapter; Lt. Col. Roland H. Mapes, chairman, Tokyo Post; Lt. Col. Charles W. Gibbs, Tokyo Post and Lt. Col. William M. Thames, Tokyo Post.



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### Philippine Post:

The Philippine Post was organized at Clark Air Force Base during the fall of 1949 with a charter membership of 29. Officers of the post are: Chairman—Maj. Forrest V. Diehl; 1st vice-chairman—Manuel A. Vargas; 2nd vice-chairman—1st Lt. Wyatt L. Law; Secretary—Capt. Bernard R. Grossman; Treasurer—SFC William A. Finney.

### Tokyo Post:

At a meeting of the post on January 10th, the following new officers and directors were unanimously elected: Chairman—Lt. Col. R. H. Mapes, commanding officer, 71st Signal Service Bn.; 1st Vice-Chairman—Lt. Col. Jamie L. Wicker, Hq. 1808th AACs Wing; 2nd Vice-Chairman—Mr. C. B. Allsopp, vice-president, International Telephone & Telegraph Corp.; Secretary—Miss Nina Jo Culver, Signal Section, GHQ, FEC; Treasurer—Capt. D. V. Mayer, Hq. FEAF.

Approximately 125 members and guests were present at the meeting. Entertainment featured showing of the film, "The Battle of Okinawa," and a social hour afterwards.

### Yokohama Post:

Grouped around the Headquarters Eighth Army at Yokohama, the Yokohama AFCA Post provides a fine medium for the acquaintance and association of the numerous communications personnel of the Army, Navy and Air Force in that area. Present officers of the post are: President—Lt. Col. Robert B. Tomlinson; 1st vice-president—Mr. Frank Hagen; 2nd vice-president—Capt. David M. Uhler; Secretary—Maj. Edgar DuBois.

### Fort Monmouth

Although busy with arrangements for the national convention, the Fort Monmouth Chapter took time out on February 9th to hold a chapter meeting at the Noncommissioned Officers' Club. In the absence of the president and vice-president on temporary duty, the meeting was conducted by Maj. J. D. Evans, Jr., senior member of the board of directors.

The members officially adopted the chapter constitution which will be published and distributed to the entire membership. National Council members were chosen as follows: Maj. Gen. F. H. Lanahan, Col. J. D. O'Connell, Col. W. A. Beasley, and Mr. W. L. Seibert, alternate.

S/FC Albert Cohen gave a short talk on the "Army Career Plan" which contained considerable information of value to many of those present. M/Sgt Pat Mulcahy, who was one of the chapter's guests for the evening, spoke on the subject, "Benefits of AFCA," in such a convincing manner that at the conclusion he became a member of the organization.



Comdr. William H. Groverman, head of Underseas Warfare Branch, Office of Naval Research, addressing the Greater Detroit Chapter meeting, Michigan Naval Armory.

The final speaker was Capt. Henry E. Bernstein, USN, Director of the Armed Services Electro Standards Agency, who gave an interesting talk on the problems in connection with the operations and plans for the future of ASES and the results being accomplished on a joint basis in standardizing the component parts of electronic equipment.

After the meeting, a program of entertainment was presented by the Special Services School of the Post.

### Greater Detroit

Chapter members met at the Michigan Naval Armory in Detroit on January 26th to hear a talk of "Sonar" by Commander W. H. Groverman, head of the Underseas Warfare Branch of the Office of Naval Research in Washington.

At the close of the discussion period which followed the address, the group inspected the sonar equipment in use at the Armory.

### Kentucky

Mr. Carl Nielsen, studio supervisor of radio station WHAS, Louisville, was the featured speaker at the February 10th dinner-meeting of the Kentucky Chapter. Representatives of several of the local broadcasting stations were special guests. The meeting took place at the Lexington Signal Depot Officers' Club and was attended by 85 members.

Following dinner, a short business meeting was held. Durward McKee and Bernard Haeffling were chosen to represent the Kentucky chapter on the National Council.

Mr. Nielsen addressed the group on

the subject "Inside Glimpse of 50 KW Clear Vision Broadcasting Station," and then showed a CBS film entitled "Television Today."

A tour of the U. S. Naval Reserve Training Station at Lexington, arranged by Lt. Commander, W. H. Bargeloh, featured the chapter's March 10th meeting.

Sixty-five members and guests attended dinner at Capps Coach House in Lexington and then went on to the training station where they were welcomed by Commander Bargeloh.

At the conclusion of the inspection which covered all phases of the station's training facilities, two movies were shown—one on the subject of radar and the other depicted an atom bomb test.

The Kentucky Chapter has organized a sub-chapter in the Louisville area called the Louisville-Fort Knox Sub-Chapter. This will enable members in that area to take a more active part in chapter activities since the some 89 mile distance to Lexington prevented many from attending the monthly meetings there. The sub-chapter charter will be officially presented on April 14th when the entire Kentucky Chapter will visit Fort Knox for a tour of the Armored School.

Capt. Stephen A. Cisler, Jr., USMCR, vice-president of radio station WKYW, Louisville, was chosen to serve as the sub-chapters' first president. Perry W. Esten, chief engineer, radio station WGRC, Louisville, was elected secretary-treasurer. A program committee has been set up as follows: Lt. Col. Caesar Fiore, USA, Fort Knox; Capt. Carl W. Nielsen, AUS, Louisville, and Major John B. Werkman, ORC, Louisville.

### New York

The first 1950 meeting of the New York Chapter took place on January 25th at Fraunces Tavern Restaurant, New York City, and featured an address by Federal Communications Commissioner E. M. Webster.

Chapter President Thompson H. Mitchell, Executive Vice-president of RCA Communications, Inc., announced the formation of a convention committee, headed by Brig. Gen. A. W. Marriner, to handle arrangements for the fourth national AFCA convention. Col. George P. Dixon, AFCA Executive Secretary, was present and, in the absence of General Marriner, reported on the results of the meeting of the convention committee and covered at length the very fine program being arranged by Maj. Gen. F. H. Lanahan and his staff at Fort Monmouth for the second day of the event, May 13th.

Commissioner Webster's address on the manifold problems of frequency allocations was most timely as, with the integration of the armed service, it appears that more frequencies may be made available for commercial communication use. A discussion period



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followed and many members expressed their agreement with the points brought out by Commodore Webster.

Admiral Thomas C. Kinkaid, Commander of the Eastern Sea Frontier, was the guest speaker at the February 23rd meeting of the chapter. The gathering was held at the Third Naval District's Officers Club in the New York Naval Shipyard, Brooklyn, and was attended by 110 members and guests.

Admiral Kinkaid discussed the growth of communications in the Navy from the use of flag and blinker signals to modern radio and radar systems, and told a number of anecdotes about his experiences with Naval communications over a forty-year period. He described a few incidents in the Battle of Leyte Gulf, where he commanded the Pacific 7th Fleet, in which efficient radio communications played a most important part in the defeat of the Japanese fleet. Many laudatory comments have been received regarding his talk.

### Pittsburgh

The chapter's March 14th meeting was devoted to a discussion of the proposed agenda for the chapter presidents conference which was submitted to each chapter by Col. George P. Dixon, AFCA Executive Secretary, early in March. The conclusions reached were reported to headquarters by Chapter President E. J. Staubitz of the Blaw-Knox Div. and appear under Association Affairs.

### Sacramento

The Sacramento Chapter held its regular monthly meeting at the Sacramento Signal Depot on January 18th. Over 200 members and guests assembled to honor Brig. Gen. A. M. Shearer, Chief, Procurement and Distribution Division, OCSigO, and former commanding officer of the Sacramento Signal Depot, and the conferees of the Depot Commanders' Conference (in progress January 16-20). The list of conferees included technicians, statisticians, engineers, supply officials and key personnel from all Signal Depots and Signal Sections of General Depots within the United States, as well as top military personnel from the Office of the Chief Signal Officer in Washington. General Shearer, it will be recalled, was instrumental in the establishment of the Sacramento Chapter and served as its first president.

Refreshments were served at the officers' club prior to the dinner meeting which took place at the Post restaurant.

Chapter president Milton G. Mauer of the Pacific Tel & Tel Company presided and introduced the distinguished guests. Col. Harry L. Vitzthum, commanding officer of the Sacramento Signal Depot, welcomed the gathering and General Shearer delivered a very impressive message on AFCA affairs and

urged all in attendance to become members of the association. Mr. Murle C. Schreck, president of the Sacramento Chamber of Commerce, welcomed the visiting guests to Sacramento. Mr. Paul Shaad, program chairman, discussed plans for the next monthly meeting.

The main speakers for the evening were Major Joyce B. James, executive officer of the ACS, and Major T. A. Pugh, supply officer of the ACS. The topics presented dealt with the operation and supply of the Alaska Communications System. The selected subjects were very timely and actual photographs were shown to emphasize the difficulties and problems encountered.

### San Francisco

Members and prospective members of the San Francisco Chapter met on January 27th at the Don Lee Building to discuss plans for the reactivation of the chapter. The meeting was conducted by Mr. Harry E. Austin, local manager of RCA Communications, Inc., who is serving as president pending formal election of new officers.

In attendance were representatives of the local telephone company, point-

to-point radio companies, broadcasting companies, and communications, electronic and photographic industries.

The meeting was addressed by Col. Lloyd C. Parsons, signal officer of the Sixth Army, Capt. C. C. Ray, communications officer of the 12th Naval District, and Col. G. B. Hoffman, director of communications for the 4th Air Force, each of whom presented the views of their service on the necessity for an organization such as AFCA and for the active participation of the communications, electronic and photographic industry in our association.

A new group member has already been added to the roll: the Lenkurt Electric Co., Inc., of San Carlos, manufacturers of carrier current equipment and components.

### Southern California

An inspection and demonstration of the facilities and operation of the Armed Forces Radio Service, Hollywood, featured the January meeting of the Southern California Chapter.

Their March meeting was addressed by Captain Coryell, USN, who had been in charge of the establishment of the breakwater at the Normandie

Upper: identified at table receiving Okinawa Post memberships are: Capt. Joseph A. Beauregard, Lt. Col. William E. Kaley, Maj. Glen Tanner, Capt. Marvin Winters, 1st Lt. William A. L. Clayson, Jr., all of RYCOM.

Lower: Newly elected officers and two committee members of Okinawa Post. L to R: DAC Carl P. Dunkel, treasurer; M/Sgt. Doyle W. Morris, 1st vice president; Col. Wellington D. Dillinger, Committee member; Col. Joy T. Wrean, pres.; Lt. Col. W. F. Dix, committee member; Lt. Col. C. H. Lewis, 2nd vice pres.; and Capt. J. A. Beauregard, secretary.





## CHAPTER NEWS

beaches. He reviewed some of the problems entailed in this operation and illustrated the application of the lessons learned to the setting of a similar breakwater at the Island of Guam.

### Seattle

The first 1950 meeting of the Seattle Chapter, held at the American Legion Hall on February 21st, also inaugurated the chapter's third year of activity as an AFCA unit.

Outgoing president Maurice F. Kerr opened the meeting by introducing the various guests and then formally installed the newly elected officers as follows: President—Clarence D. Lawrence; 1st Vice-president—Marshall James; 2nd vice-president—Hershall Wandling; treasurer—Joe Gregory; secretary—Clarence C. Bodine, who was reelected for a second term.

The chapter's new board of directors are: Maurice F. Kerr, Merville McInnis, John Rozanski, Frank D. Keyser and Col. Fred P. Andrews, who was also chosen to serve on the national council for a second year.

President Lawrence then took over the chair and outlined plans for 1950. A general discussion followed as to the best suited programs for meetings. It was decided to arrange demonstrations of commercial equipment and to present talks on technical subjects so that non-technical members might become better informed.

### Washington

The Army Signal Corps has accomplished in its 87 years of existence, and particularly during the last war and the postwar period, notable progress in communications operations, research and development, and procurement, distribution and training, because it is a member of a team composed of science, industry and armed services," Maj. Gen S. B. Akin, Chief Signal Officer, declared in an address before a luncheon meeting of 150 members of the Washington chapter of the Armed Forces Communications Association March 7 at Fort Meyer, Va. The group later toured the Signal Corps station WAR, and the mobile communications center at Fort Meyer and the Army Communications Center at the Pentagon.

Leading officers of the communications-electronics segments of the Armed Forces were guests of the Washington Chapter at the head table and included: Maj. Gens. William O. Reeder, Deputy Chief of Staff (G-4) and Kirke B. Lawton, Deputy Chief Signal Officer; Brig. Gen. I. L. Farman, Deputy Director of U. S. Air Force Communications; Brig. Gen. Wesley T. Guest, Chief of the Army Communications Division; Capt. W. B. Ammon USN, Deputy Chief of Naval Communications; Capt. A. L. Becker, USN, Chief of Bureau of Ships Electronics Division; Capt. C. A. Rumble, USN, Electronics Officer on the staff of the Chief of Naval Operations;



Capt. O. C. Ray, USN, communications officer, 12th Naval District, and Col. G. B. Hoffman, director of communications, 4th AF, speaking before meeting of San Francisco chapter. L to R: Col. Hoffman; Harry E. Austin, RCA Communications, interim chapter president; Col. Lloyd C. Parsons, Sig O, 6th Army; Capt. Ray; and T. I. Razovich, interim secretary.

Col. A. F. Binney, Marine Corps, Chief of Electronics for Navy Aeronautics; Col. J. R. McGraw, Chief of USAF Electronic Systems Division; Col. E. R. Petzing, Chief of Signal Corps Engineering and Technical Division; Col. H. M. Pulsifer, Second Army Signal Officer; Col. A. J. Mandelbaum, Chief of Signal Corps Training; Col. W. W. Jervy, Chief of the Army Pictorial Service Division; and Captain Donald E. McKay, Chief of Communications of the U. S. Coast Guard.

Other leading government communications officials attending the affair included Sidney K. Wolf, Executive Director of the Munitions Board Communications-Electronics Committee; and Leighton H. Peebles, who heads the communications-electronics activities at the National Security Resources Board, Francis H. Engel, Washington representative of RCA Victor and President of the AFCA Washington chapter, presided at the luncheon.

The notable success of the meeting was obviously owing to the leadership and enthusiastic efforts of chapter President Engel and Secretary Edward Cover. The excellent luncheon arrangements, highly praised at the meeting, were carried out in the fashion which is becoming recognized as the handiwork of Secretary Cover.

At the outset of his address, General Akin declared it was especially fitting that the commemoration of the 87th anniversary of the Signal Corps should be held at Fort Meyer, named for the first Chief Signal Officer. It was there that the Signal Corps had its first communications training school, conducted early experiments in the adaptation of telegraphy for military purposes, initiated the first center for the collection of

meteorological observations, and the first tests of military aviation.

The Chief Signal Officer related how the Signal Corps research and development responsibilities cover a multiplicity of fields—communications, electronics and its various applications, meteorology, sound and light, photography and radiological instrumentation. He also with a graphic chart, showed how the entire Army communications systems is integrated into one system for communications without interruption or delay.

## STUDENT CHAPTERS

### Texas Tech

Lt. Col. W. P. Litz, chief of the Signal Corps ROTC affairs section, Washington, D. C., spoke before a meeting of the Texas Tech Chapter on February 14th. He presented the latest items of interest concerning the Signal Corps and the ROTC program and answered questions concerning ROTC students and their place in the Armed Forces.

New chapter officers were elected as follows: president—Arthur E. Seybold; 1st vice-president—Delton A. Wilson; 2nd vice-president—Glen E. Berry; secretary—Frank N. Foster; treasurer—Jack B. Covey; program chairman—Charles N. Pendergraf. The chapter's sponsor is Capt. William C. Neubauer, Assit. PMS&T.

### University of Alabama:

The chapter reports it had a record turnout of 100 persons for its February 20th meeting.

The program was furnished by the local telephone company and consisted of a most interesting demonstration of the behavior of microwaves.



# NEWS—SERVICES and INDUSTRY

## GENERAL

### Truman Nominates Communications Policy Board

#### New Civil Defense Head

Paul J. Larsen, recently consultant to the Western Electric Co. in the institution of operations of the Sandia, N. Mex., laboratory of the Atomic Energy Commission, was sworn in Wednesday, March 1, as Director of Civil Defense Planning, under the National Security Resources Board.

Mr. Larsen will supervise not only civil defense planning but also preparations for mobilization of health resources, housing and community service, strategic dispersal of industrial and government facilities, and censorship, in event of war.

He formerly was associate director of the Los Alamos, N. Mex., scientific laboratory for the University of California and later director of the Sandia laboratory when the school operated that facility for the AEC. When the Sandia Corp., Western Electric subsidiary, began operation of the laboratory last November 1 at the request of the AEC, Mr. Larsen remained as a consultant during the changeover.

After taking office Mr. Larsen testified before the Joint Congressional Atomic Energy Committee and paid tribute to the thorough planning by his predecessor in the NSRB, the late Russell J. Hopley, emphasizing the work of the Hopley report staff.

With the announcement by President Truman, March 30th, that he had appointed Air Force Secretary W. Stuart Symington to the chairmanship of the National Security Resources Board, it was also understood that plans are now under way to strengthen the NSRB and make it one of the most important agencies in the Government.

#### I.R.E.'s Biggest Meeting

Keynoted on the aim of its officers and directors for a convention which would emphasize the latest developments in the radio-television and radio-communications field, the Institute of Radio Engineers held its 39th annual meeting in New York City at the Commodore hotel and the Grand Central Palace through March 6-9, bringing some 10,000 IRE members plus about 6000 guests to hear 170 papers delivered on the latest radio wonders and interrelated sciences by members of the IRE and to view more than 250 exhibits of electronic equipment, materials and components.

Aside from the papers delivered at the convention by members of the Institute, to acquaint their colleagues with their work in specialized fields, the more general purposes of the organization were pointed up in highlight talks

(Continued on page 48, col. 3)

A five-man communications policy board with the highest caliber of members, headed by Dr. Irvin L. Stewart, president of the University of West Virginia and former FCC commissioner and vice chairman, was appointed by President Truman Feb. 17.

The board is to make recommendations to the President on the development of a national communications policy, including the scarcity of radio frequencies, both domestic and international; the all-important question of merging the American international communications companies through an "objective review;" the problem of assuring an equitable distribution of the available supply of frequencies among all claimants, both governmental and private; and the extent to which the government should in time of peace continue to operate its own communications facilities.

The board was asked by President Truman to study and make recommendations to him "on the policies and practices which should be followed by the federal government in this field in order best to meet the broad requirements of the public interest." The President stated that "in view of the need for early action in this field" he would like to receive the board's final report "no later than Oct. 31, 1950."

The outstanding ability of the new communications policy board, which the President appointed as a temporary group, made it one of the outstanding selections of a group of men for such a task by the Nation's chief ex-

ecutive since he has been in the White House. Besides Dr. Stewart who was designated by President Truman as board chairman, the other members are:

Dr. Lee A. DuBridge, president of the California Institute of Technology, who during the war was director of the M.I.T. radiation laboratory and who is ranked as one of the nation's leaders in the field of physics, and an outstanding atomic scientist;

President James R. Killian, Jr. of the Massachusetts Institute of Technology, who has served on the faculty of M.I.T. since 1933;

Professor William L. Everitt, head of the department of electrical engineering of the University of Illinois, who during the war was director of operational research in the Office of the Chief Signal Officer, and was a member of the communications sections of the national defense research committee and a former president of the Institute of Radio Engineers; and David H. O'Brien of Hackettstown, N.J., retired vice president of Graybar Electric Co. and former assistant administrator of the War Assets Administration (war surplus) and during the war director of distribution in the Army Signal Corps.

Dr. Stewart served as Federal Communications Commissioner from the date that agency was created, July 11, 1934, to June 30, 1937, and did not choose to seek reappointment. He was chairman of the FCC telegraph divi-

(Continued on page 44, col. 2)

### FCC Report On Non-Broadcast Services

In the various non-broadcast radio fields, dominated by the safety and special services, there are now in operation more than 300,000 transmitters, including land and fixed stations and associated mobile units, it was shown in a tabulation issued by the FCC.

Of the total number of non-broadcast transmitters, the FCC pointed out, about 100,000 are land or fixed stations and more than 220,000 are mobile units, or a ratio of about two mobile units for each base or fixed station.

The safety and special services, the tally showed, now operate over 290,000 of the non-broadcast transmitters. In the safety and special services there are some 94,000 land or fixed stations operating in conjunction with 196,000 mobile units.

In a further breakdown of the FCC's figures, about 26,000 stations, including 2200 base or fixed stations and over 23,600 mobile units, are being used by the common carrier services. The figures are based on a compilation, just completed, of the FCC's records as of June 15, 1949.

#### Taxi radio has about 50,000 stations

Among the safety and special services, the public safety systems were shown to be operating 63,423 transmitters with 50,752 being used by police organizations—state, county and municipal. Land transportation took the second rung in the tally with 54,533 transmitters, showing taxicabs with a surprising 2,497 base stations and 47,974 mobile units licensed to account for the major portion of 54,471 stations in land transportation.

Railroads were the second highest category in the land transportation service with 213 base stations and 2,388 mobile units for a transmitter total of 2,601.

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### Telefax at Capitol

With Speaker of the House Sam Rayburn, Senator Ernest W. McFarland, chairman of the Senate Interstate Commerce communications subcommittee, and chairman Robert Crosser of the House Interstate and Foreign Commerce Committee sending the first facsimile telegrams from the Capitol, the Western Union Telegraph Co. March 7 placed in operation its Telefax method of telegraphy, at two locations in the Capitol on the Senate and House sides, in the Senate Office Building, and in the new and old House Office Buildings. Another Congressman, Rep. Charles Halleck, (R., Ind.), former House Republican leader, also transmitted a facsimile message.

Speaker Rayburn sent a greeting telegram by Telefax to President Truman, while Senator McFarland and House Committee Chairman Crosser both sent Telefax messages to Western Union President Walter P. Marshall. Senator McFarland, in addition, sent a facsimile message to Eugene Pulliam, Phoenix, Ariz., newspaper publisher, and Rep. Halleck's telegram went to the Western Union manager at his home town of Rensselaer, Ind.

The members of Congress found the new Telefax method of operation simple and there was a large demand for its use, according to telegraph officials at the Capitol. Attending the ceremony of inaugurating the service at the Capitol were several Western Union officials, including Vice President Joseph R. Redman, Assistant Vice President Kenneth W. Heberton and Washington Superintendent G. T. Harris.

### MB Budget Hearing

The importance of industrial mobilization planning to determine the military requirements in the communications field as one of the vital services for the nation's armed forces in event of a war emergency was cited by Maj. Gen. P. W. Timberlake, USAF, director of the staff of the Munitions Board, during the hearings before a House Appropriations subcommittee on the \$4,170,000 funds for the Munitions Board for the next (1951) fiscal year, which are only about \$100,000 larger than this year's budget.

Other than the inclusion of communications in the broad sphere of the Munitions Board's planning and studies on military requirements, production allocation, reserve plant program, and industrial preparedness measures, General Timberlake and the board's new chairman, Hubert Howard, had little specific reference to the communications-electronics procurement subjects. General Timberlake did stress that, in connection with the planning of the aircraft production program, the quantities of radio and radar equipments could be determined after the armed

services had consolidated their requirements for completed aircraft.

### Sidney Wolf Committee Progressing

Under the active leadership of the Munitions Board communications-electronics committee's executive director Sidney K. Wolf, that committee is progressing ahead substantially in planning and policy formation in cooperation with the manufacturing industry on military radio-electronics preparedness. Mr. Wolf and his assistant, Thomas Parrett, have staged a monthly meeting with the joint Electronics Committee of the board March 20. Chairman of the committee is Brig. Gen. E. C.

### Communications Policy Board (Continued from page 43)

sion as well as commission vice chairman. During the war he was executive secretary of the national defense research board and the office of scientific research under Dr. Vannevar Bush.

In his letter to Dr. Stewart, President Truman stressed that since "communications services represent a vital resource in our modern society" there is accordingly "a major public interest in assuring the adequacy and efficiency of these services." Development in the communications field "during and since the war have created a number of problems which require careful consideration at this time," the President wrote.

The President wrote to Dr. Stewart that "an overall, objective review of this entire situation is urgently needed," since the problems proposed for study are of vital importance to the economy of the nation, its international relations and our national security, and cannot adequately be considered "on a piecemeal basis" for the development of "a total national communications policy, designed to assure the most effective utilization of the various forms of communications facilities."

President Truman stated "I feel the problem of radio frequencies will be one of the most important areas for the board's investigation." He expressed the hope that, "as a result of its studies, the board will be able to recommend possible means for conserving frequencies, as well as standards for determining the relative priority of competing claims for frequencies, and possible administration arrangements within the Government for assuring, on a continuing basis, a sound and equitable allocation of the limited frequency supply." (The President's appointment of the board would appear to "wash out" the need for a frequency control board as proposed in the Sadowski bill before the House Interstate Commerce Committee, unless Dr. Stewart's board should determine and recommend such an agency as a permanent segment of the executive branch of the government.)

The "full cooperation and assistance of all parties concerned" was assured to the communications policy board by

Langmead, USAF, Munitions Board director of military progress. Members are: Army—Brig. Gen. Harry Reichelderfer, director of Signal Corps laboratories at Fort Monmouth, and as alternate, Col. Eugene V. Elder, assistant chief of Signal Corps procurement and distribution division; Navy—Rear Admiral Rico Botta, assistant chief of Naval material, and as alternate, Captain C. A. Rumble of the office of Chief of Naval Operations; and Air Force—Maj. Gen. F. H. Griswold, assistant deputy chief of USAF staff for material, and as alternate, Col. Leigh H. Hunt, chief of USAF industrial planning division.

President Truman. This would mean every governmental agency concerned with communications, it is felt, such as the FCC, the State Department's telecommunications policy staff (where Dr. Stewart started his career in Washington), the Civil Aeronautics Administration, the Army Signal Corps, Naval Communications, Air Force Communications Directorate, the Bureau of Standards, Radio Technical Commission for Aeronautics, Radio Technical Commission for Marine Radio Service, and Coast Guard Communications.

The President listed in his letter some of the major specific problems and developments which have arisen in communications during and since the war that require careful consideration as follows:

"The extent to which the government should, in time of peace, continue to operate its own communications facilities is one such problem of current importance." (This subject is now under study by the Senate interstate commerce communications radio subcommittee, headed by Senator McFarland of Arizona, and reports have been requested from all government departments which have communications system or are concerned with communication.)

"The question of merging the overseas operations of our commercial communications companies also requires objective review." (The FCC is now preparing its reply on the subject of international telegraph communications merger for Senator McFarland's subcommittee as the only agency sought for views so far on this subject. As Dr. Stewart headed the FCC telegraph division for three years, he is regarded as especially well equipped to direct this study. The President's letter did not differentiate between international telephone and cable radiotelegraph communications, but it is assumed that only overseas telegraph services would be under study.)

"The most pressing communications problem at this particular time, however, is the scarcity of radio frequencies in relation to the steadily growing demand for frequencies domestically, and even greater difficulty is being encountered internationally in attempt-



ing to agree upon allocation of available frequencies among the nations of the world." (The latter reference undoubtedly bears upon the difficulties which have plagued the provisional frequency board at Geneva. The board's deliberations should be of outstanding benefit and aid to the United States delegation in the administrative radio conference next September at Geneva. Then, too, in domestic frequency situation, the board with its highly capable membership and such frequency experts in their own right as Dr. DuBridge, Dr. Everitt, and Dr. Stewart, by virtue of his own FCC experience, will be able to analyze and survey the controversies of broad frequency requirements. The latter include the pressing requirements of the mobile safety-special radio services as contrasted with the desires of the television industry to gain more spectrum space. The board will be able to work apart from a political and pressure charged atmosphere.

"In face of this growing shortage, the problem of assuring an equitable distribution of the available supply of frequencies among all claimants, both governmental and private, is rapidly assuming major prominence." In this field the work and deliberation of the 27-year old IRAC is certain to be surveyed by the communications policy board with complete impartiality and recognition of its constructive work and of any defects. Two of the board members, Dr. Stewart and Dr. Everitt, have concrete knowledge of the IRAC's operations and that will be most helpful phase of this portion of the studies assigned by the President.

What is deemed of the greatest significance in the exceptional calibre of the five members of the communications policy board is that no member has a selfish or biased interest or viewpoint, in the opinion of close observers. All of them are known to be men of the highest integrity and their abilities and personal records of achievement are most notable.

Following is the text in part of the portions of the President's executive order on Feb. 17 establishing the communications policy board:

"1. There is hereby created a board to be known as the President's Communications Policy Board which shall be composed of a chairman and four other members to be designated by the President.

"2. It shall be the function of the board to study the present and potential use of radio and wire communications facilities by governmental and non-governmental agencies and to make and present to the President evaluations and recommendations in the national interest concerning (a) policies for the most effective use of radio frequencies by governmental and non-governmental users and alternative

administrative arrangements in the federal government for the sound effectuation of such policies, (b) policies with respect to international radio and wire communications, (c) the relationship of government communications to non-government communications, and (d) such related policy matters as the board may determine.

"3. The board is authorized to hear and consult with representatives of industry and the federal government concerned with the subject under study by the board. All executive departments and agencies of the federal government are authorized and directed to cooperate with the board in its work

and to furnish the board such information as it may require in the performance of its duties. The board shall protect the security of any classified information submitted to it."

(The remaining two paragraphs of the Executive Order dealt with funds for the board, to be paid from the President's emergency fund. The members will be paid per diem and expenses.)

*Partial Text Of Letter To Dr. Stewart;* The text of the letter of the President to Dr. Stewart follows, in part:

"Communications services represent a vital resource in our modern society.

(Continued on page 58, col. 1)

### FCC Report

(Continued from page 43)

The amateur radio service showed the largest total of transmitters of all the non-broadcast services, with 81,675. Citizens' radio now has an estimated 300 mobile units in service, the tally showed.

The FCC's tallies of the various services were as follows:

	Land or fixed stations	Portable or mobile units	Total transmitters
Safety and special services:			
Aircraft .....		23,723	23,723
Aviation ground .....	1,987	4,314	6,301
Total aeronautical services .....	1,987	28,037	30,024
Police .....	3,425	47,327	50,752
Fire .....	174	3,118	3,292
Forestry .....	493	7,774	8,267
Highway maintenance .....	139	682	821
Special emergency .....	70	221	291
Total public safety services .....	4,301	59,122	63,423
Ship .....	—	18,140	18,140
Coastal and marine relay .....	425	—	425
Radar .....	—	863	863
Other marine .....	18	167	185
Total marine services .....	433	19,170	19,613
Railroad .....	213	2,388	2,601
Transit utility .....	42	1,108	1,105
Buses and trucks .....	7	304	311
Taxicabs .....	2,497	47,974	50,471
Total land transportation .....	2,759	51,774	54,533
Power radio service .....	1,925	23,248	25,173
Petroleum .....	370	5,474	5,844
Forest products .....	80	874	954
Relay press .....	6	60	66
Motion picture .....	2	103	105
Low-power industrial .....	—	37	37
Special industrial .....	157	1,787	1,944
Provisional and experimental .....	225	2,025	2,250
Total industrial services .....	2,765	33,608	36,373
Experimental, Class 1 .....	179	2,078	2,257
Experimental, Class 2 (misc.) .....	195	2,484	2,679
Total experimental .....	374	4,562	4,936
Citizens .....	—	300	300
Amateur .....	81,675	—	81,675
Total civilian radio service.....	81,675	300	81,975
Total safety and special.....	94,304	196,573	290,877
Domestic public land mobile service.....	369	—	369
Base .....	369	—	369
Auxiliary test .....	154	—	154
Control .....	9	—	9
Mobile .....	—	23,602	23,602
Total .....	532	23,602	24,134



## NEWS

### Intercity Video Net Expands

Seventeen further cities will be added to the Bell System's intercity television network by the end of 1950, increasing the TV network to nearly 15,000 channel miles, a summary of the plans and progress of the American Telephone & Telegraph Co. long lines department discloses.

Long lines reported that 31 radio relay stations have been erected between New York and Chicago, and the equipment now is being installed. After thorough testing, the service will begin in September. By October, it is anticipated, the Chicago-Des Moines radio relay chain will be in service. West of Omaha, it was added, sites for stations have been optioned as far as Denver, and construction will begin later this year. Service over that section is expected to be launched in May, 1951.

Additional radio relay construction this year will add links between New York and Washington and between Richmond and Norfolk. The New York-Washington service will be in operation in April, and the Richmond-Norfolk link in July.

By the end of this year, it is expected, 42 cities will be connected to the Bell System network, of which 40 now have stations on the air. The points to be added this year are Memphis, Norfolk, Johnstown, Greensboro, Charlotte, Jacksonville, Atlanta, Birmingham, Indianapolis, Louisville, Davenport, Rock Island, Minneapolis, Omaha, Kansas City, Des Moines, and Ames, Ia. Des Moines does not have a TV station on the air at present. Memphis is expected to be linked by March 1.

On the west coast, two northbound Bell System radio relay channels between Los Angeles and San Francisco will go into service this spring.

In the extension of TV service to a number of Southern cities, coaxial cable will be used. Existing cable from Richmond to Jacksonville, and from Jacksonville to Atlanta and Birmingham, will be equipped for television. By October, the three midwest coaxial cable routes will be equipped for TV, including the Des Moines-Minneapolis cable, already in service for telephone purposes. Construction of the Indianapolis-Louisville cable. The new cable, of course, also will provide telephone service.

In Texas, construction is expected to begin this fall on a coaxial cable between Dallas and Houston.

### SC & AF Larger Bid Awards

The Machlett Laboratories of Springdale, Conn., received a \$202,675 procurement contract from the Signal Corps, and General Cable Corp., obtained a \$138,378 procurement award for cross-connecting insulated wire during the first week of February.

At the same time, the U. S. Air

### Stratovision In New Yorker Story

The Stratovision airplane (television broadcasting from the stratosphere) developed by the Glenn L. Martin Company, and Westinghouse Corporation and described in a SIGNALS article May-June 1948 is featured in an humorous futuristic story in the *New Yorker's* anniversary issue dated February 25th.

The author, E. B. White, whacking away at present day scientific and socialistic trends, projects the reader into a future period undefined as to time except for such indications as might be taken from developments like dairy cows no longer being bred naturally, giving milk in a steady stream around the clock; pollination being effected with chemicals, bees having become extinct; and the relater of the story receiving two hundred and twenty-five dollars a week salary of which two hundred and ten is withheld, still leaving an adequate balance since government social benefits provide almost all of an individual's needs. The Army has succeeded in establishing a space platform six hundred miles up and the personnel aboard the platform are well supplied with the "New Weapon"—a destructive device which has made the H-bomb obsolete.

The Stratovision plane, called "Stratovideo" in the story, is required for television broadcasting because insects called "earwigs" through their habit of eating into coaxial cables had caused the discontinuance of the use of the coaxial.

Force disclosed that, among the larger procurement contracts during January, General Electric is to produce \$100,000 worth of electronic component parts and Sylvania Electric Products, Inc., was awarded a \$248,250 procurement action for services and production development on vacuum tubes.

### Added Frequencies Granted

License authority for the use of additional frequencies was granted two international telegraph carriers by the FCC February 15.

Press Wireless was given a license modification to add the frequencies 11457.5, 13118.7, 13837.5, 13842.5, and 15827.5 kilocycles at its Hicksville, N. Y. station. RCA Communications was granted six months' special temporary authority to use 7717.5 and 20180 kc.

### Arctic Radar Defense Holds Difficulties Says Baldwin

The difficulties of radar defense in the Alaska-Yukon area, due to the mountainous terrain, have been brought out in the first combined United States-Canadian Arctic maneuvers, "Exercise Sweetbriar," news dispatches disclose. It would be completely impossible to provide in the northland a radar screen that could detect the approach of all enemy bombers, and it would be a

tremendous economic expenditure to attempt to establish such a radar network, according to *New York Times* military editor Hanson Baldwin.

Mobile early warning and search radars are being used in "Exercise Sweetbriar." But it is felt that the best air warning defense can do would be to protect important airfields, centers of population and factory installations, and tests are being staged on the use of defending jet fighters through radar warnings.

### FCC's Webster and Sterling Receive Marconi Awards

In recognition of the lifetime each has spent in outstanding service in the radio art, FCC Commissioners E. M. Webster and George Sterling were awarded Marconi Memorial Medals by the Veteran Wireless Operators Association at a banquet at the Hotel Astor in New York City February 25th. President William J. McGonigle of the association extended the invitations to the two FCC commissioners.

An AFCA member, and a familiar figure to several of the AFCA chapters because of his talks at chapter meetings Commissioner Webster is one of the nation's leading authorities in the safety and special services and marine communications field. He has been active in communications since the early days of his service with the U. S. Coast Guard, following his graduation from the Coast Guard Academy in 1912. He joined the FCC in 1938, and became assistant chief engineer before returning to active Coast Guard service in World War II as Chief of Communications. After serving as director of telecommunications for the National Federation of American Shipping, he became an FCC member in March, 1947, and was confirmed last year for a full seven-year term.

### REA Appointment

In the first appointment of what are expected to be the top-drawer posts in the Rural Electrification Administration for telephone activities—the assistant chiefs of the four REA divisions—Raymond W. Lynn, a career government electrical engineer, has been named assistant chief of the engineering division with principal responsibility for the design and construction of rural telephone plant.

Mr. Lynn, a 1933 graduate of Ohio State University, has been regional construction engineer for the REA district comprising Missouri, Arkansas, Louisiana, and Oklahoma. Before joining the REA in 1936, he served as an engineer with the Civil Works Administration, the Federal Emergency Relief Administration, and the Works Progress Administration.

### Senate Appropriations Hearing

Meanwhile, REA went before the Senate Agriculture Appropriations subcommittee in support of its funds request for the coming fiscal year, including the request for \$50 millions for





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rural telephone loans. Under the omnibus appropriations procedure this year, the Senate subcommittees are going ahead with hearings, so that they can begin marking up the overall funds measure for the 1951 fiscal year as soon as it passes the House. The REA already has had its hearing before the House group. Heretofore, Senate hearings were not held until after House passage of the various separate appropriations bills.

It is thought that the 224 loan applications received by the REA are for a total amount coming close to the \$25 million authorized for the loans during the current fiscal year, ending June 30. The first 144 applications were for a total of about \$13 million, it is understood.

REA sources emphasize, however, that the total amount applied for actually means little, since the funds actually authorized vary widely from the amount initially sought after engineering work is done and the REA forces survey the situation. Of course, other major considerations would be the rate schedule of the borrower and the loan security, as measured by the applicant's present and expected future ability to repay the money.

It is now expected that the first REA rural telephone loan is imminent. It was understood that REA processing of the first loan is virtually completed, and the actual issuance of the loan may come, probably in a ceremony in Washington, in the immediate future.

Meanwhile, REA sources said that while the agency is always interested in keeping equipment prices as low as possible—with the obvious advantages both to the borrower and the government, as the lending agency—it is felt at this early stage that there is less room for driving down equipment costs in the rural telephone field than there was in rural electrification. In the electrification program, it was pointed out, power companies were accustomed only to heavy pole-line construction and REA developed means of lighter construction with attendant savings. The telephone service, it is pointed out, and opportunities to reduce equipment costs are probably much fewer in number. The only specific cost item which has been seriously viewed in the agency to date, it is felt, is that of carrier equipment, which at present cost is not felt to lend itself widely to rural telephone expansion.

#### FCC Common Carrier Bureau

As the first step in the projected four-bureau reorganization of the Federal Communications Commission along functional lines, the FCC announced March 9 that all common carrier activities will be integrated under a newly-established Common Carrier Bureau, to begin operations April 3.

The FCC announced March 10 that Harold J. Cohen, Assistant General

#### Bell Labs Deaths

##### Jansky

Karl G. Jansky, who was world famous for his discovery in the 1930's of radio waves emanating from interstellar space and had been a research engineer with the Bell Telephone Laboratories since 1928, died in a Red Bank, N. J., hospital February 14 at the age of 44. He was serving at the time of his death as a research engineer at the Bell Laboratories experimental station at Holmdel, N. J.

Mr. Jansky was an expert on radio transmission and particularly on atmospheric and other forms of interference, and had headed the Bell Laboratories development of special recorders and directional antennas.

##### Jehle

Arthur O. Jehle, Controller of the Bell Telephone Laboratories, who would have observed his 40th year with the Bell System in May, died February 11 in a New York hospital at the age of 55 as a result of complications following a fractured skull received in a fall.

After studying accounting at Columbia University, he joined Western Electric Co. in 1910 as a record clerk. In 1921 he was put in charge of accounting and cost methods of the Engineering Department of Western Electric, which was later transferred to the Bell Laboratories in 1925. He rose through other posts to become chief auditor and chief accountant of that department. In 1942 he was appointed general auditor of the laboratories, and in 1945 was named controller.

Counsel who has been in charge of common carrier legal activities, will be the Chief of the Common Carrier Bureau. At the same time, the FCC designated Curtis B. Plummer, who has headed the Commission's television engineering activities, to the long-vacant post of Chief Engineer, with John A. Willoughby, who has been Acting Chief Engineer, named Assistant Chief Engineer in the newly-formed Office of the Chief Engineer. Under the new organization, the former law, engineering, and accounting bureaus were abolished, and offices of the Chief Accountant, Chief Engineer, and General Counsel were established, with no common carrier functions except advising the FCC on policy and work on matters which involve other services as well as common carrier.

The new bureau will have the following divisions: Telephone, to handle matters relating to the services of the Bell System and Independent telephone companies, including teletypewriter exchange and telegraph services, and international domestic telegraph companies, but not including any common carrier radio application, all of which would come under the Telephone Division; International, to handle all international telephone and telegraph matters except international telephone rates; and Statistics, to collect sta-

tistical data, publish reports, and coordinate recommendations for changes in reports.

#### Bransford W.E. Director

Joseph R. Bransford, financial and personnel relations vice president of the Western Electric Co., was elected a director of the company Feb. 16 to fill the vacancy of George L. Best, who resigned to become a vice president of the American Telephone & Telegraph Co.

#### I.R.E. Convention

(Continued from page 43)

delivered before full gatherings of the IRE by Dr. Ralph Bown of the Bell Telephone Laboratories, Maj. Gen. F. L. Ankenbrandt, Director of Communications, Department of the Air Force, and Sir Robert Watson-Watt, who headed up the work leading to the British radar "screen" for World War II and who is a new vice president of the IRE.

In addition to the representatives of U.S. and state government agencies manufacturers, engineering concerns, and radio users who attended the convention, participating also in the IRE proceedings were delegates from about 30 foreign countries.

Leading an FCC contingent at the IRE convention were Commissioners Frieda B. Hennock, E. M. Webster and George E. Sterling and Acting Chief Engineer John S. Willoughby.

36 special technical meetings were held and 169 papers were presented on topics ranging from theory to the finished products in radio-communications, broadcasting, television, computing machines, sound recording circuit theory, ultra-high frequency transmitter and receiver design and operation and some delving into the world of nucleonics.

Exhibits at the Grand Central Palace—topping previous IRE shows—ranged from complete communications, television and radio stations plus developments in allied fields, to the smallest components in ordinary home radio sets.

Accent at the convention was on microwave transmission and television, highlighted with regard to the former by developments shown by the military services and the latter by the Radio Corporation of America, DuMont Laboratories, Inc., and Color Television, Inc.

Dr. Bown, in his address which featured the opening meeting of the convention, stressed the development of television, and pointed to TV to become far more than an entertainment medium. Dr. Bown brought out that each noteworthy development in communications has come in roughly 25-year periods through the past century and that from now until 1975, with regard to television, "radio and communications engineers must lead in finding



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out what the future holds for it." The Bell Laboratories scientist saw in television a "private servant to each individual in the way his automobile and his telephone serve him to do what he wants when he wants to do it" and he posed as "a good nut for you to crack" the "little matter of transoceanic television."

Dr. Bown saw the possibility in the next 25 years of the development of transoceanic television which could be tied in with international telephone communications—the caller could then be sure of the identification of the person he was calling.

Dr. Bown emphasized that radio engineers have now developed their art in frequencies so high that they are destroyed by absorption and deflection in the atmosphere and are scattered by rain and snow with the result that "We will need to give increasing attention to conservation and economy in our use of frequency space."

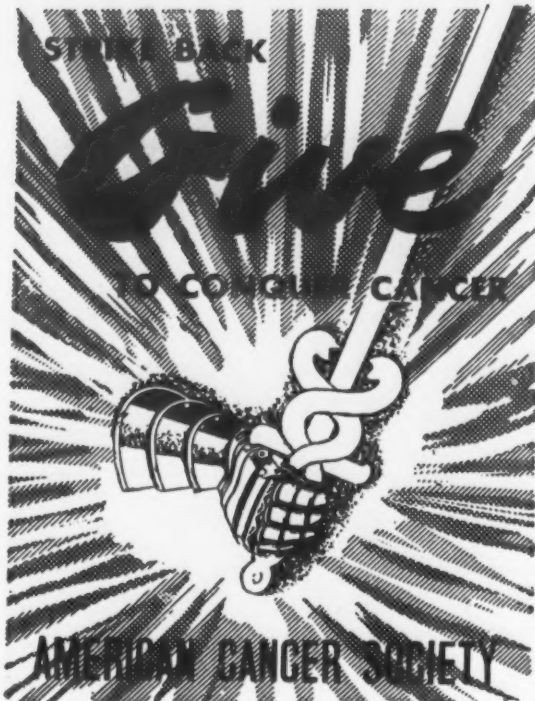
However, he said, "we do not need to go higher (in the frequency range) to have enormous room for progress since the opportunity to expand our technology into full usage of the frequency ranges already available is perfectly tremendous."

#### Ankenbrandt Sees Reserve Potential

General Ankenbrandt looked to organizations such as the IRE to provide the "real reserves" for the military services, stressing the ready adaptability of radio engineers taken out of civilian life to the needs of the Air Force during the war and emphasizing his point by detailing the steps taken in the establishment of the communications links from Washington, D. C., to the Marianas Islands in the Pacific—a distance of about 9000 miles—under some conditions which, as he said, could have been overcome only by the "remarkable ingenuity" shown by his engineering group, many of whom had only previously been converted from mufti to uniform.

Sir Robert Watson-Watt delivered a highly entertaining talk at the March 7 President's luncheon—at which Raymond Guy, National Broadcasting Co. Manager of Radio and Allocation Engineering took over the gavel as the new head of the IRE to succeed Stuart L. Bailey—in which he related a number of off-record stories concerning his associations with Winston Churchill, at the time the British radar net was being established, but the English scientist's discussion carried the serious undertone that only the unfettered engineers can produce his country's most essential needs in time of emergency.

Proving of outstanding interest at the IRE convention were the papers delivered at the four-day sessions by military communications and radio experts and their latest developments in such fields as radio-teleprinter, radiotelephone and miniature electronic circuits.



On Wednesday, March 8, the Institute's annual dinner was held at the Hotel Commodore with Harold B. Richmond, Chairman of the Board of the General Radio Co., as principal speaker and at which the annual awards for merit in the radio-electronics field were presented. These awards included the 1950 Medal of Honor to Professor Frederick E. Terman, Dean of the School of Engineering, Stanford University; the Browder J. Thompson Memorial Prize to Joseph F. Hull and Arthur W. Randalls of the Signal Corps civilian staff; the Editor's Award to E. J. Barlow of the Sperry Gyroscope Co. Research Laboratories; the Moris Liebmann Memorial Prize to Otto H. Schade, research engineer of the Radio Corporation of America Victor Division, and the Harry Diamond Memorial Award to Andrew V. Haeff, consultant with the Naval Research Laboratory. Thirty fellowship awards of the IRE were also given at the dinner.

The IRE proceedings at the convention also produced the activation of the Institute's Professional Group of Vehicular Communications (previously formed as the Vehicular and Railroad Communications Group) with A. B. Buchanan, Supervisor of the Radio Section of the Detroit Edison Co., W. A. Shipman, Executive Engineer of the United Fuel Gas Co. of Charleston, W. Va., and George J. Maki, Senior Communications Engineer, State of California Division of Communications, leading in a discussion on purposes of the new organization. It is expected that the group will spearhead an organization which will bring into the IRE more engineers in the mobile radio field to further the standards for the various Safety and Special Services. Mr. Maki will undertake the formation of a division of the IRE Vehicular Communications group in California under plans made at a special meeting at the IRE convention.

In addition to the above mentioned members of the Vehicular Communications Group, others in the organization

to spearhead its movement include R. C. Stinson of the Chrysler Corp., Detroit; E. H. I. Lee of the Detroit Edison Co., Dr. Daniel E. Noble, Motorola Inc. Vice President; F. T. Budelman, Vice President and Chief Engineer of the Link Radio Corp.; C. N. Kimball, engineer for the Bendix Radio Division, Detroit; E. C. Denstaedt, Detroit Police Department; H. C. Wepler, mobile telephone engineer of the Michigan Bell Telephone Co., and H. A. Penhollow, radio engineer for the Detroit Edison Co.

## AIR FORCE

### Sub-miniature Tube

In what is hoped to be a major answer to the problem of reducing the weight and size of its airborne electronic equipment, the U. S. Air Forces' Air Materiel Command announced at Wright-Patterson AFB, Dayton, O., that it is developing a "Tom Thumb" synthetic radio tube, about the size of a match head.

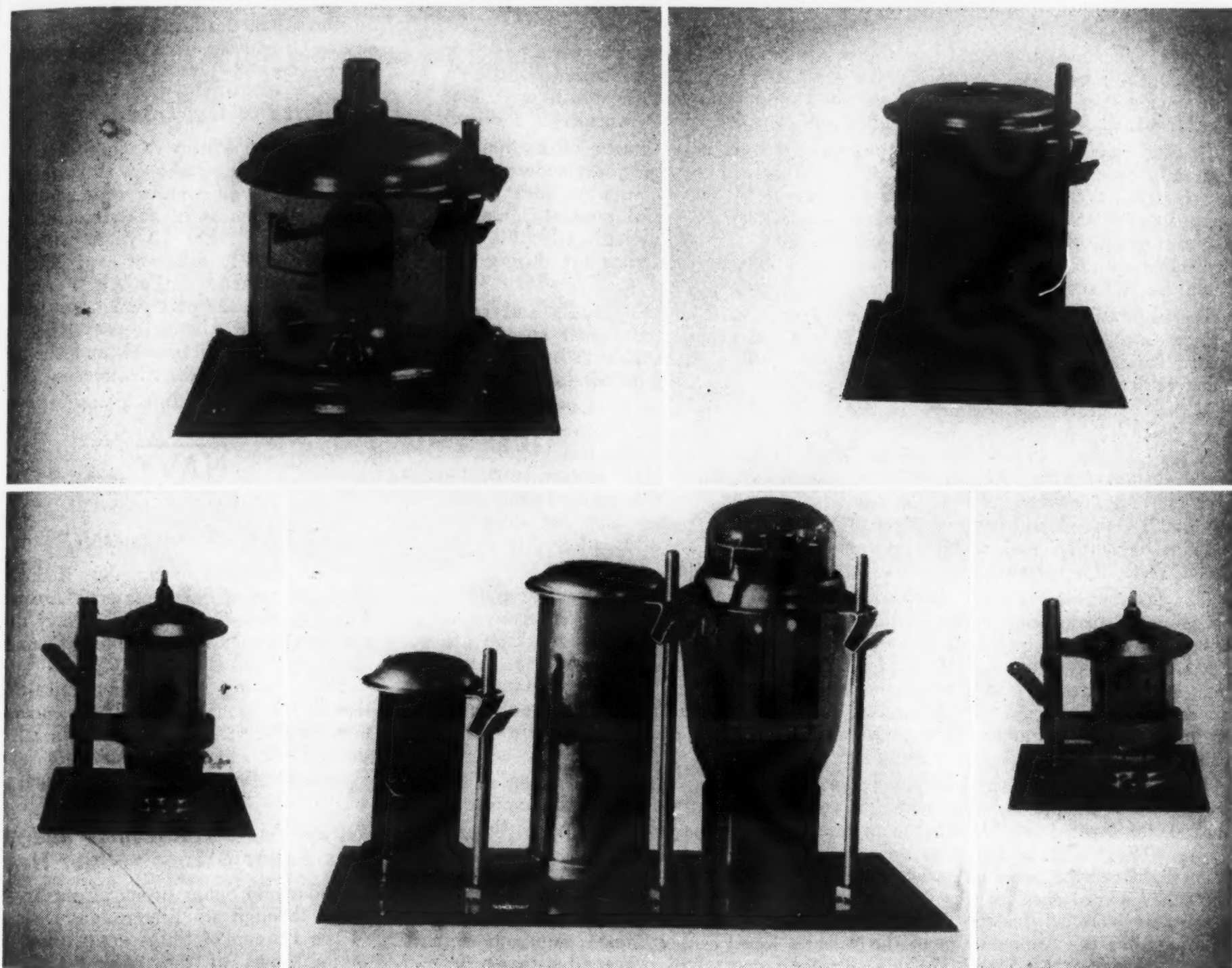
Called a "fieldistor," the sub-miniature tube, which is about 1/90th the size of the present day tube, is now in the early stage of development at the Air Materiel Command's Components and Systems Laboratory. Colonel Duggar, Components and Systems Laboratory Chief, emphasized that the "fieldistor" is still in the process of development and about 250 have been made, by hand, at present. The new tube offers tremendous advantages from a weight and space standpoint—an all important factor in aircraft equipment. In appearance, it resembles the end of an eye dropper, and ten of them could be carried in an ordinary thimble.

There is possible adaptation of the small tube to civilian usage in such items as radio, television, hearing aids, fire and burglar alarms, thermostats, etc. But Colonel Duggar said that he did not expect to see any of the new devices in civilian items for some time. It was pointed out that the tube is still a bit too noisy and the cost in hand production is too high, but with mass production methods the cost could come down to a reasonable price.

The small size and structure of the "fieldistors" will also enable them to withstand better engine vibration, gunfire and landing shock, which literally shakes the life out of the conventional tube. Since modern aircraft uses hundreds of tubes in its radio and electronic and radar equipment, the space and weight saved by the "Tom Thumb" devices means longer aircraft ranges at reduced operating cost. Another big advantage of the new tube is that it uses so little current that most batteries can be eliminated and only one small battery used.



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## NEWS

General Ankenbrandt also stressed the close cooperation of the U. S. Air Force with the Civil Aeronautics Administration on the electronics aids to navigation and the coordination with the Navy on the UHF conversion. He added that "under the leadership of the joint communications-electronics committee" (headed by Maj. Gen. H. M. McClelland) the Air Force and Navy have succeeded in standardizing the procurement of a single airborne radio set and of operational requirements and this has resulted in competition between two manufacturers with a material decrease in prices. The electronic equipment in "cocooned" B-29s will probably remain serviceable, he noted.

Seven electronics programs are included in the \$115 million funds for procurement of Air Force electronics equipment and communications material for the 1951 fiscal year, Maj. Gen. F. L. Ankenbrandt, director of communications of the Air Force, told the House Defense Department appropriations subcommittee in hearings which were released March 3.

Most of the present ground electronics equipment now in use is wartime stock, generally outmoded or obsolescent, General Ankenbrandt emphasized, and these equipments "are now approaching the end of their useful life due to wear and tear, resulting in extremely high maintenance costs and very unreliable service."

Stating that the Air Force is purchasing specialized items of equipment, generally used only by the Air Force, under its five to seven-year modernization program, General Ankenbrandt stated that "replacement with modern equipment is required as soon as possible to permit the aerial combat forces to operate effectively wherever required by their global mission" and this will capitalize on the tremendous advances made in the electronics art during and since World War II.

He emphasized that "without the latest and most effective radio and radar equipments," the new aircraft of the very latest types with higher speeds and longer range capabilities under current procurement to provide an efficient and effective first-line-of-defense force "will be unable to perform its mission properly."

Major programs as outlined by the Air Force Director of Communications were for UHF conversion—the third increment of a five-year program—\$28,171,685, for USAF global communications, \$2,385,823 to complete the basic equipment requirements for the Air Force world wide communication system, with the next two increments of the five year program to be smaller and devoted principally to installation of equipments procured in previous years; and for electronic aids to navigation and weather system essential to an all-weather Air Force, \$23,884,687, the fourth increment of a seven to nine year program.

The last named includes continuation of GCA radar, the airport surveillance radar omni-directional radio range, VHF airborne navigation receiver, low frequency loran, and airways point-to-point facilities. General Ankenbrandt also cited the requirement of \$760,932 for the military amateur radio system, which he stated is extremely valuable in further training in military and civilian radio operational practices and procedures, and in creating a source of additional trained radio communications personnel for military service in event of an emergency.

Maj. S. A. Singer, chief of the programming branch of the director of Air Force communications, also testified on the justification for the request of \$4,250,000 for costs of leasing commercial communication systems by the Air Force. These systems included the allotment of \$1,253,760 for the USAF military flight service communications system, which is a unified network used by the other armed services, the Coast Guard and the Air National Guard and Air Reserves; \$934,791 for the Air Force command communications network, which ties together the commanders of the various USAF subordinate commands with the AF Chief of Staff and enables command control of the combat-ready field forces; \$929,213 for the USAF aircraft control and warning network, which is essential to the defense of the United States and Alaska; and \$517,199 for the USAF weather facsimile map service network.

The other items included the Military Air Transport Service teletype network, for which \$136,000 would be allotted, and the USAF weather teletype network with \$281,828. Major Singer stated that both the Bell System and Western Union are "fighting to get the teletype network business" and noted that Western Union has a telemeter service for which there is a slight economy for certain point-to-point installations. He added that the Air Force pays the rates established in the tariffs filed with the FCC.

Both Major Singer and Brig. Gen. Edmund C. Lynch, director of USAF Headquarters manpower and organization, stated that long distance telephone calls and telegrams had to be approved by superiors before such services were used. General Ankenbrandt and Major Singer in their testimony emphasized that the Air Force worked closely with the Civil Aeronautics Administration and the Weather Bureau on communications operations over commercial facilities and with the Signal Corps and Navy.

## Personnel Changes

### AACS Reassignments

Lt. Col. Thomas N. Arnett, from CO of the 1908th AACS Squadron, the Pentagon, to the 1087th AACS Wing, Wiesbaden, Germany.

Major Taylor S. Shreve, from Hq 1800th AACS Service Wing, Tinker AFB, Oklahoma, to Hq 1808th AACS Wing, Tokyo, Japan.

Major Junius W. Moore, from the 1928th AACS Service Squadron, MacDill AFB, Florida, to the 1938th AACS Squadron, Ramey AFB, Puerto Rico.

Capt. Joseph M. Pagano, from CO of 1901st AACS Squadron, Fairfield-Suisun AFB, California, to the University of Oregon as assistant professor of air science and tactics.

### Gugliotta to Hq. USAF

Lt. Colonel Philip A. Gugliotta was assigned to Hqs. USAF on 19 December 1949, as the electronics representative in the Directorate of Procurement and Engineering. After 12 years with the Signal Corps in different capacities he was transferred to the Air Force in 1946. During the past year he attended classes in the Air University, the Air Command & Staff School, and the Air Communications & Electronics Staff Officers Course.

## NAVY

### CNC Becomes DNC

Rear Admiral John R. Redman, USN, has been redesignated "Director, Naval Communications" in a Navy title change from "Chief of Naval Communications."

The Director, Naval Communications title is traditional in the Navy communications service, and it was in effect until 1945 when the Chief of Naval Communications designation was adopted.

### Navy Radio-Electronics Budget Has Radar & Sonar Major Items

Radar and Sonar procurement by the Navy through its Electronics Division of the Bureau of Ships constituted the major items of the total budget of \$79,906,000 asked for radio-electronics equipment purchases in the 1951 fiscal year, starting next July 1, according to testimony before the House Appropriations Defense Subcommittee released March 17, while Naval Communications with Captain William B. Ammon, Deputy Chief, presenting the requirements asked for \$20,103,000 for the next fiscal year of which \$11,479,000 is for operation of the Navy communication system.

The release by the House Appropriations Committee of the presentation by the Navy Department concluded the publication of hearings by all three armed services and paved the way for the House Committee to draft in final form the omnibus or one-package funds



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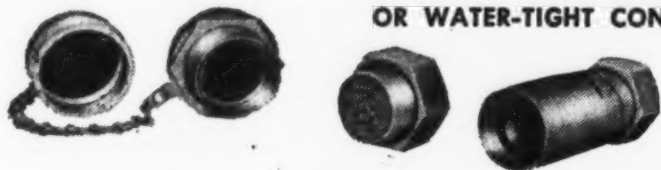
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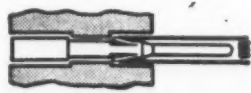
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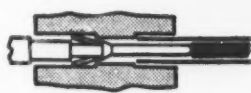
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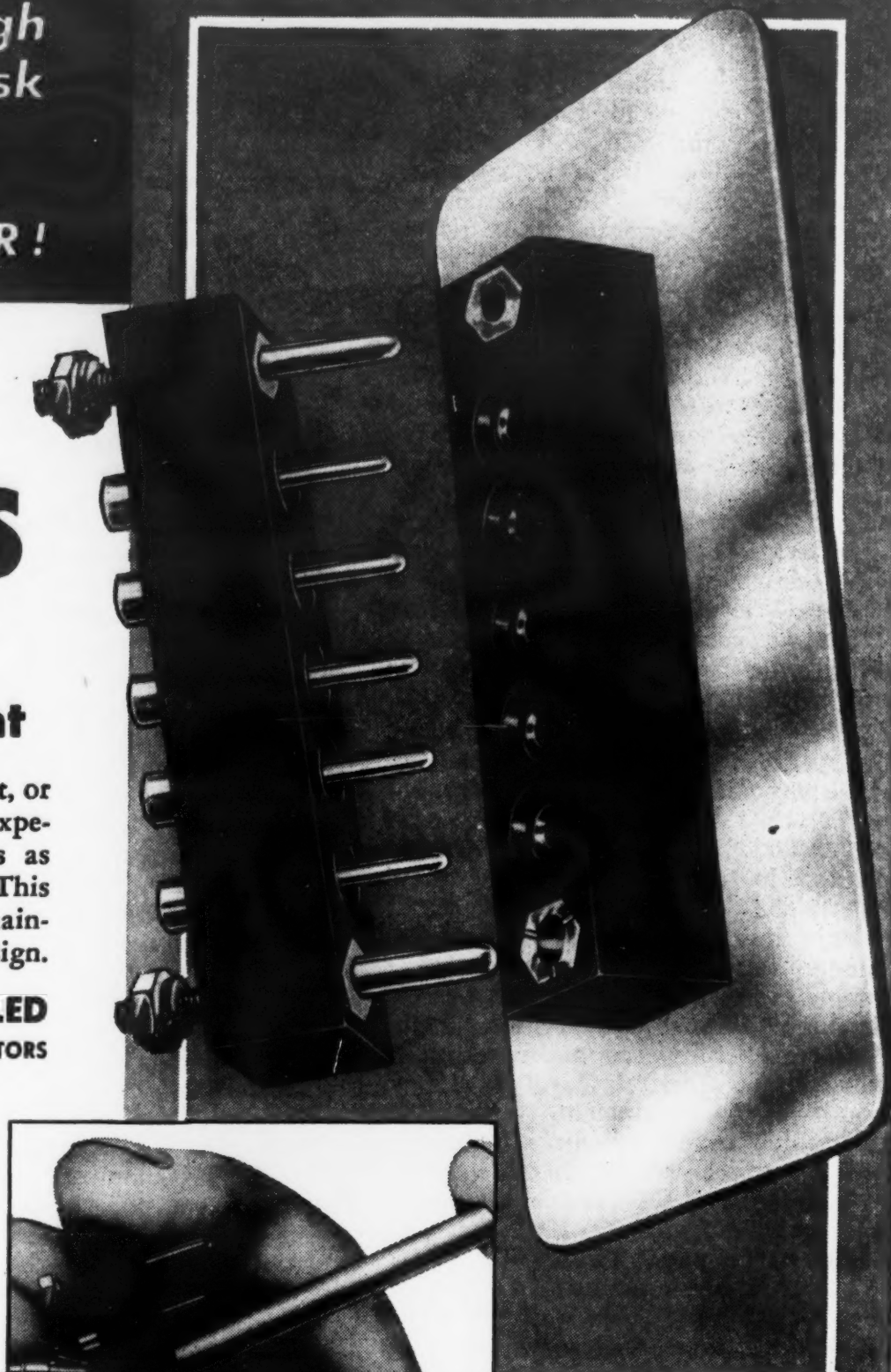


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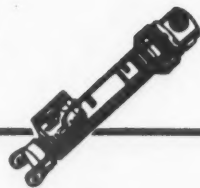
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measure for the entire government. The latter bill is slated to reach the House floor during the last week in March and the House Appropriations Committee is understood to have cut the budget of the government as recommended by President Truman by 4 per cent or \$1,213,000,000 and the funds for the three Armed Services from \$13,028,000,000 to \$12,839,000,000. Secretary of the Navy Mathews and Admiral Forrest P. Sherman, Chief of Naval Operations, in their testimony before the House Committee warned that the President's 1951 military "economy" budget of \$13,028,000,000 will reduce naval aviation, anti-submarine and other forces below an "adequate defense" level to maintain them in "first-line condition" as well as not giving the Navy completely adequate means to combat a submarine threat.

The radio-electronics procurement program of the BuShips Electronics Division calls for the expenditure of \$25,350,800 for radar, an increase of \$17,897,000 over the funds for that equipment during the present fiscal year, and of \$24,693,200 for sonar which is \$18,285,150 more than was allotted during the current year. Other major items of procurement requested in the 1951 fiscal year program by the Bureau of Ships as outlined by its chief, Rear Admiral David H. Clark, were: Radio equipment, \$4,402,300; Electronic countermeasures units, \$3,006,000 which was an increase of \$2,449,550 above this year's allotment; electronic tubes, \$6,095,100; electronic maintenance parts, \$8,838,000; radiac, \$1,703,800, a decrease of \$300,300 under this year's funds; test equipment \$2,039,900; and engineering services, \$3,060,000. Another sum for electronic apparatus for Naval Reserve was also sought, amounting to \$2.2 million.

Admiral Clark emphasized that the new electronic procurement plan is considered "mandatory" by the Chief of Naval Operations and Secretary of Defense Johnson for the antisubmarine warfare and air defense programs. Equipment of the highest classification and of modern design is needed, the Joint Chiefs of Staff have determined, according to Admiral Clark, to have the Navy's Fleet meet the operational standards basically essential to national security. The equipment now in use, Admiral Clark stressed, "is so obsolete technologically that it is of no value in the military assistance program."

In the aircraft modernization projects of Naval Aviation, Rear Admiral Alfred M. Pride, Chief of the Navy Bureau of Aeronautics, brought out that the fund of \$26,650,000 in the next fiscal year was for procurement of improved radio-communication equipment, countermeasures apparatus, identification and recognition devices and navigational-aids equipment. These requirements are primarily the result

In reply to questioning by Reps. Mahon (D., Tex.), and Sikes (D., Fla.) Major Singer declared that the use of radio for weather service point-to-point communications would be dependable and economical but that the commercial companies and the FCC will not permit the military to use radio frequencies for transmitting this type of service. He did say to the House body that the commercial communications services were more efficient; that interference in radio would be a bad factor; and that the Air Force could not get enough trained radio operators for this work. The Air Force, however, now is negotiating with the CAA to utilize the facilities of the commercial airports to report back into the Air Force system at no cost, he declared.

General Ankenbrandt was commended by subcommittee chairman Mahon for his technical experience and for his presentation.

of new frequency allocations, he added. Admiral Pride broke down the modernization requirements in the 1951 budget as providing 80% of over-all requirements for radio communications, 30% for airborne early warning radar, 33% for identification, 3% for navigational aids, 20% for countermeasures electronic devices and one-third of the total for electrical equipment for the planes. The Navy "must have aircraft equipped with up-to-the-minute electronic equipment to combat the menace" of modern high-speed, deep-diving, long-submerged submarines, especially the low-noise snorkel types, Admiral Pride stressed.

Captain Ammon in his testimony expressed the regrets of Rear Admiral John R. Redman, Chief of Naval Communications, of the latter's inability to attend the hearing because of illness and stated that he and Captain D. C. Beard, head of Naval Operations and Planning Branch, were presenting the program of Naval Communications. For the Navy Communication system, he pointed out the \$11,479,000 amount was to provide service-wide communications for command purposes and operation of the Fleet as well as co-operating with the other military departments under the Joint Chiefs of Staff. The \$20,103,000 fund requested represented an increase of \$2,187,000.

"It is essential that the Navy maintain an efficient and as economical a communications service as possible consistent with available funds and geared to meet all possible contingencies of emergency or war," Captain Ammon stated, adding that all the programs in the Office of Naval Communications were considered essential for Fleet support. He said the policy of deferral of major maintenance of communication facilities enforced during the postwar years will continue during the 1951 fiscal year but expressed hope future budgets will provide for the most essential of the backlog of projects for conversion and replacement of outmoded World War II communication equipment. A fund of \$1,629,000 was provided for leased and commercial communication facilities, and services, an increase of \$129,000 above the present funds, Captain Ammon declared, citing that this program covers services of leased telephone lines, TWK, commercial telegrams, cablegrams and radiograms as well as weather and flight control services.

## ARMY SIGNAL CORPS

### SC's 18 Papers at IRE The "G-String"

AFCA President Frederick R. Lack notes in the president's page, this issue, that 18 papers were presented at the I.R.E. meeting this year which were either the direct result of work at Fort Monmouth or represented cooperative effort between Monmouth and some other institution.

Among the 18 papers presented was that announcing the since well-publicized development pictured on our cover this issue along with the paper's author, Dr. Georg Goubau of the Signal Corps Engineering Laboratories, Fort Monmouth, N. J.

In its next issue SIGNALS will publish all, or most of Dr. Goubau's paper. For this issue space will allow only a brief comment for the benefit of any who might have missed the details of the first announcement.

Utilizing records of studies performed over fifty years ago by A. Sommerfeld of the University of Munich, Dr. Goubau discovered by experimentation that with special insulation a single strand wire might carry telephone and television transmissions now only possible with expensive coaxial cable. A potential, in fact, was seen for the "G-String" whereby it could carry 100 different transmissions instead of the one now carried by coaxial. The inevitable controversy has arisen with the announcement of the "G-String." SIGNALS has made no evaluation, and will simply present the Goubau paper for individual decision in the next issue.

Following are listed the aforementioned 18 papers. The research and development workers are all at Fort Monmouth unless otherwise indicated:

Some aspects of Data-Transmission over Narrow-Band Communication Circuits; Millard M. Brenner.

Accelerated Life-Testing of Vacuum Tubes; Jerome Rothstein.

Signal Corps High-Frequency Radio Communication Research and Development; John Hessel, H. F. Meyer.



Military Single Sideband Equipment Development; R. A. Kulinyi.

Radio Relay Design Data 60 to 600 Mc.; R. Guenther.

Cross Talk in Frequency-and Phase Modulated Radio Relays Used in Conjunction with Multichannel Telephony Equipment; Saul Fast.

Measuring Procedure for Radioteletype Converters; H. C. Hawkins.

Broad-Band Unidirectional Antenna 50 to 170 Mc.; V. J. Colaguori, R. Guenther.

Some Novel Methods for the Generation of PCM; N. R. Castelline, D. L. Jacoby, B. Keigher.

Common Frequency Carrier-Shift Radio teletype Converter; R. R. Turner.

Surface-Wave Transmission Lines; G. Goubau.

Calculation of Effective Phase, Group, and Pulse Velocities of Wave Propagation; A. Fischler, G. H. Sloan, D. Goldenberg.

External Cathode Inverted Magnetron; Joseph F. Hull.

Diversity Reception Techniques; S. H. Van Wambeck, Washington University, St. Louis, Mo., A. H. Ross.

Comparison of Modulation Methods for Voice Communication over Ionospheric Radio Circuits; M. G. Crosby, Crosby Laboratories, Mineola, L. I., N. Y., H. F. Meyer, A. H. Ross.

Comparison of Modulation Methods for Facsimile Communication over Ionospheric Radio Circuits; M. Acker, B. Goldberg.

Miniaturization Approaches: A Discussion and Proposal; M. Abramson, S. Danko.

Telemetering Blocking Oscillator; W. Todd.

### Committee Praises Akin

The business-like operation of the Signal Corps in its cost accounting and work measurement system, which was established two years ago by Maj. Gen. S. B. Akin, Chief Signal Officer, as an integral part of his intensive management program within the Corps, won high praise recently from Rep. Harry R. Sheppard (D., Cal.) in the hearings of the House Appropriations Armed Services subcommittee on the Signal Corps funds. The Congressman also lauded a manual, "Signal Corps Cost and Productivity Program," which he felt gave the Corps leadership all the facts about its operations and needs for funds. The Signal Corps management program has eight major elements of guideposts to be used in its functioning, as General Akin explained to the house subcommittee.

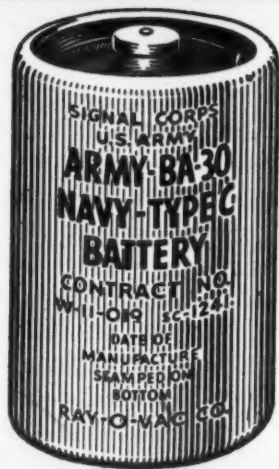
### Akin Points Up Communications Needs

In his testimony before the House Department of Defense Appropriations subcommittee on the Signal Corps 1951 budget proposal of \$157,950,000, Maj. Gen. Spencer B. Akin, Chief Signal Officer, emphasized that it was most

important for the national defense to have the latest and specialized communications-radio equipment and systems for mobile striking forces of the Army. He cited that the current (1950) fiscal year appropriation was not devoted to modernization of equipment but was concentrated on the purchase of equipment for extended field tests, service test models. None of the \$134 million, he said, was included for modernization. The next fiscal year will be the first time that the Army is beginning to modernize since the war, he added.

Subcommittee chairman Mahon (D., Tex.) praised the Signal Corps as always making a good presentation of its appropriations requirements and added "you have always done a good job." Rep. Mahon also commended Maj. Gen. K. B. Lawton, Deputy Chief Signal Officer, and Col. William P. Pence, chief of the Signal Corps fiscal division.

General Akin stated that there was a number of "critical" items of equipment in next year's Signal Corps procurement program, especially in identification radar and air-to-ground communication. "I think if you have a mobile striking force," General Akin said, "you ought to equip it with the equipment which is necessary to do the job you intended to do, and enable it to compete or engage in combat with our possible enemy in such a manner as to insure success, rather



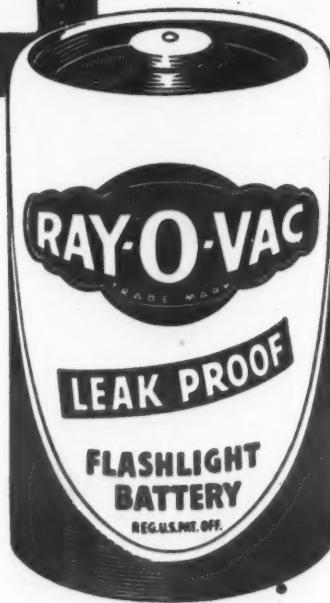
## Remember this combat veteran?

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## NEWS

than almost a certainty of failure. Communications is one of the essential elements to success in operations from all points of view. It is an essential element in the matter of command, intelligence, supply and administration."

Members of the subcommittee questioned the Signal Corps spokesman at considerable length on whether or not the Corps' 1951 budget could be cut back to the 1950 funds, and General Akin showed what fields would have to be sliced in funds and results.

General Akin and the Signal Corps received high praise for the business management procedures put into effect. Chairman Mahon at the conclusion of the testimony of Generals Akin and Lawton stated, "I think we all agree that this is a highly important field and we would not want the service crippled in any way." He declared, "we want you to go forward, and we must rely upon you to practice every economy and at the same time try to get the best efficiency."

### Big Order

In what is anticipated to be the largest single procurement action this fiscal year, the Signal Corps announced that it will invite bids during the latter part of April for about \$15 million tactical radio sets. The invitation will be made by the Signal Corps Procurement Agency at Philadelphia, and will remain open 30 to 45 days. The tactical radio sets will be vehicular and ground units of the AN/GRC 3-8 series, frequency modulated sets for tactical voice communications which call for the maximum in operational and engineering flexibility. Manufacturers will be asked to submit bids on individual major components, selected groups of major components, and on the complete group of sets. The sets are to be produced on a similar design to provide the maximum in operational and engineering flexibility.

### Key Personnel Changes

Four leading Signal Corps officers are being given new assignments which will bring about by early summer important changes in major SigCorps posts. They are as follows:

Maj. Gen. Francis H. Lanahan now commanding the Signal Center at Fort Monmouth, N. J., will take over the Army Communications Service about mid-July.

Brig. Gen. Rex V. Corput, Jr., now heading the plans and operations division will about the end of May become Chief Signal Officer of the European Command.

Brig. Gen. Wesley T. Guest now chief of the Communications Service Division will succeed Gen. Corput as chief of the plans and operations division.

Maj. Gen. Jerry V. Matejka now Chief Signal Officer of the European Command will succeed Gen. Lanahan as commanding general of the Fort Monmouth Signal Corps Center.



Shown above are the officers of the new-established Headquarters, 302nd Signal Service Group, the headquarters unit being a Signal Corps affiliated unit of the Wisconsin Telephone Co. Seated from left: Capt. R. D. Lumb, Capt. Erling Jensen, Col. L. V. Saari, commanding officer, 1st Lt. F. H. Hageman, and 1st Lt. R. P. Drews. Standing: Lt. Col. H. F. Mackin, Major K. W. Reuling, and 1st Lt. R. B. Williams.

## CIVILIAN COMPONENTS

### AACS Reserves Visit Gunter

The March training period of the 3rd Airways and Air Communication Service Reserve Wing (Prov), a reserve unit of the Military Air Transport Service, was conducted at the USAF Special Staff School, communications and electronics division, at Gunter AFB, Montgomery, Alabama.

During the two day training period the reserve officers were instructed by the regular staff of the school. Major Bell and Verner lectured on "Long-Range Communications," Major Blake, "AF Use of the Frequency Spectrum." Lt. Colonel Andrews, "Electronic Aids to Air Navigation." Conferences were led by Lt. Colonel Briggs on the "Air Force Officers' Career Program," Lt. Colonel Bond, "Communications-Electronics Maintenance Problems," Lt. Colonel Funke, "The Air Force Management Program." Training films "Radio Transmission Security" and "Technical Principles of Radar," were shown to the group.

At the conclusion of the training tour, Colonel Harold S. Grant, director of the school, lauded the members of the reserve wing for their enthusiasm and thanked them for making the monthly training period tour to Alabama.

Colonel Charles W. Gordon, commanding officer of the parent organization of the regular Air Force establishment, 1802d Airways and Air Communications Service Group at Mitchel Air Force Base, New York, with which the 3rd Reserve Wing trains one week-end each month, accompanied the reserve officers on their trip to Alabama.

### Wisconsin Telephone Affiliated Unit

In the interest of national security, the Wisconsin Telephone Company has sponsored the formation and organization of an affiliated Signal Corps Unit, Headquarters, 302nd Signal Service Group.

Under the Army's affiliation plan, the company is cooperating in the activation, organization, and training of the unit. The new unit, which will be made up of company employees, will include seven officers, two warrant officers, and 18 enlisted men. A 50 per cent over-strength in officer personnel is authorized.

The unit's commanding officer is Colonel L. V. Saari, Engineering, Milwaukee. Seven other officers have been assigned including Lieutenant Colonel H. F. Mackin, Major K. W. Reuling, Captain Erling Jensen, Captain R. D. Lumb, and First Lieutenant R. B. Williams, all of Plant, and First Lieutenant R. P. Drews and First Lieutenant F. H. Hageman, Engineering.

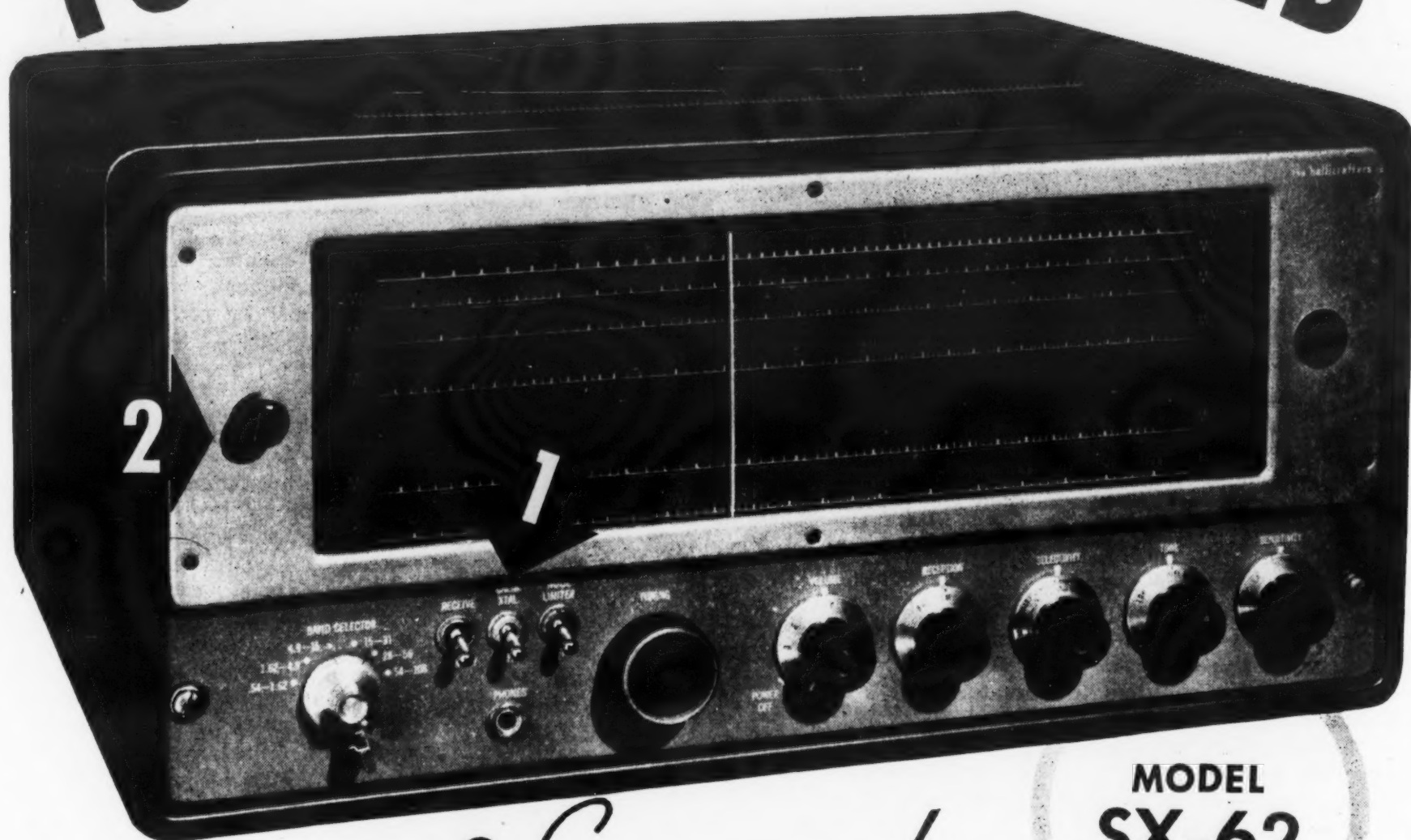
These officers have been meeting twice a month since December 1, 1949. At present, the unit has only officer personnel assigned to it. Vacancies exist in all grades of enlisted strength. Any telephone employee interested in becoming a member of the company affiliated unit should contact the commanding officer.

The Wisconsin Telephone Company unit is one of the few of its kind in the nation. The Bell System is actively supporting this phase of the Signal Corps program and other affiliated units have been activated for most Bell System companies.

In a letter to Vice President John H. Paige, Major General S. B. Akin, Chief Signal Officer, expressed his appreciation of the Wisconsin Telephone Company's cooperation in the Army's



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Affiliation Program. "The organization of this unit," he stated, "will insure the prompt and efficient utilization of your highly skilled personnel to perform a vital service for our nation in the event of a national emergency. In view of the ever increasing importance of the time factor in the early stage of mobilization, the availability of well-trained affiliated units such as you are organizing is most essential."

### Policy Board

(Continued from page 45)

They make possible the smooth functioning of our complex economy; they can assist in promoting international understanding and good will; they constitute an important requirement for our national security. There is, accordingly, a major public interest in assuring the adequacy and efficiency of these services.

Developments in this field during and since the war have created a number of problems which require careful consideration at this time. The extent to which the Government should, in time of peace, continue to operate its own communications facilities is one such problem of current importance. The question of merging the overseas operations of our commercial communications companies also requires objective review. The most pressing communications problem at this particular time, however, is the scarcity of radio frequencies in relation to the steadily growing demand.

Increasing difficulty is being experienced in meeting the demand for frequencies domestically, and even greater difficulty is encountered internationally in attempting to agree upon the allocation of available frequencies among the nations of the world. In the face of this growing shortage, the problem of assuring an equitable distribution of the available supply of frequencies among all claimants, both governmental and private, is rapidly assuming major prominence.

"I feel that the problem of radio frequencies will be one of the most important areas for the board's investigations. I hope that, as a result of its studies, the board will be able to recommend possible means for conserving frequencies, as well as standards for determining the relative priority of competing claims for frequencies, and possible administrative arrangements within the Government for assuring on a continuing basis, a sound and equitable allocation of the limited frequency supply. I believe that the studies to be undertaken by the board are of vital importance to the economy of this Nation, to our international relations, and to our national security. I am sure that you will receive the full cooperation and assistance of all parties concerned."

The utmost cooperation and assistance of the Senate interstate and foreign commerce subcommittee on communications with the new national communications policy board, especially in connection with board's studies of the international telegraph communications merger question, was understood to have been offered by Senator Ernest W. McFarland (D. Ariz.) chairman of the subcommittee, to President Truman in a late afternoon conference at the White House Feb. 23. It was reported that the Nation's chief executive was amazed at the huge amount of "spadework" accomplished in the survey of international communications and the entire communications field by Senator McFarland's subcommittee.

In the discussions with the President, it was reported that the thought was expressed the international communications merger review should be "cut out of the herd" of the other subjects assigned to the board and given expeditious treatment so that, if possible, legislation could be drafted and considered by Congress at this session. Senator McFarland also informed the President, it was said, that his subcommittee had engaged in a comprehensive assembly of material from the various government departments on the competition of government communications systems, including the overseas networks and the domestic general services administration system.

Brigadier General David Sarnoff, past president of AFCA, chairman of the board and chief executive of the Radio Corporation of America, also had a half-hour conference with President Truman in the forenoon of February 23rd. The RCA chairman cited that he had discussed a number of highly important subjects related to communications, radio and world affairs. General Sarnoff who visited Washington on his return from a brief stay in Florida, stated the topics which were reviewed could not be disclosed by him.

Because of General Sarnoff's eminent position in world and United States communication and global affairs, it was deemed particularly significant that the RCA board chairman had a half-hour conference with the President almost immediately after the appointment of the communications policy board. General Sarnoff, it is known, is admired by the President and is frequently consulted on broad world questions, and especially upon questions related to communications and radio, because he is deemed one of the world's outstanding authorities in the latter field. It is also understood that General Sarnoff has been highly impressed with the work of the Senate interstate commerce communications subcommittee, as have been the principal officers of the other communications companies.

Meanwhile, Dr. Stewart, advised that there had not yet been a chance to determine "housekeeping details" as to headquarters and staff of assistants for the new agency and, since the members of the board are rather widely scattered, it was probably advisable to get some of the preliminary matters cleared up before the board comes to Washington for its first meeting. It may be necessary, it was indicated, for Dr. Stewart, to come to Washington for a discussion of some of the preliminary matters before the first meeting is scheduled.

Meanwhile, delving back into Dr. Stewart's career with FCC, it was interesting to note that he was the first FCC proponent before Congress to urge the study of permitting mergers in the telegraph field because of the financial plight of the telegraph carriers.

In fact, Dr. Stewart, who headed the FCC telegraph division from the creation of the commission in 1934 until his voluntary retirement in 1937, discussed at considerable length the necessity and advantages of the consolidation of the nation's telegraph companies during his confirmation hearings before the Senate interstate commerce committee in late January and on Feb. 2, 1935. Preceding that, on Jan. 21, 1935, the first chairman of the FCC, the late Judge E. O. Sykes, submitted a recommendation for the amendment of the Communications Act of 1934 to permit consolidation or consolidations of telegraph companies.

This recommendation for such legislative authority was based on hearings, held under the direction of former telegraph division chairman Stewart, on Dec. 3-5, 1934. The views of Dr. Stewart in the confirmation hearings before the Senate interstate commerce committee were contained on pages 97-99 in the hearings before the Senate committee on interstate commerce 74th Congress, First Session, on the confirmation of the members of the Federal Communication Commission, Jan. 23-25, 28, 29 and Feb. 21, 1935.

The fact that Dr. Stewart during his FCC service was favorable toward the consolidation of the telegraph companies is of special significance, it is felt, because one of the assignments of President Truman to the new board is an "objective review" of the overseas operations of the American communication companies, evidently with the goal of formulating a unified governmental policy on the question of a merger. After Dr. Stewart left the FCC, one of his proposals came to fruition—the 1934 Congressional Act which consolidated Postal Telegraph with the Western Union Telegraph Co.

Because so much has transpired in the past 15 years, it would not be appropriate to recapitulate Dr. Stewart's testimony and legislative recommendations on this subject, but it could be stated most accurately that Dr. Stew-





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art, in his confirmation hearing, had the complete respect of the members of the Senate interstate commerce committee as to his testimony and knowledge of the telegraph industry, as was illustrated by the Senators.

On the subject of the telegraph industry merger problems, and a merger of the international cable-radio telegraph companies, Congress today is fortunate in having a most capable and hard-working Senator, engaged in the study of these questions in Senator McFarland, who has given a great deal of attention to this field. Senator McFarland, as is well known, has already launched some time ago in this session—and in two previous Congressional sessions—studies and consideration of the international merger. Thus, President Truman and the board in this objective "review" have already on hand a most substantial amount of valuable data and information on communications through the work of Senator McFarland and his subcommittee. The Senate interstate commerce committee in this field also is greatly aided by the work of its highly capable communications expert aid, Edward Cooper, who has been engaged in following this subject since before the war.

The executive order of President Truman in creating the board called upon the communications industry companies as well as inter-government agencies to assist the board in conferences and hearings, which would undoubtedly be closed. This is the procedure that was established by President Truman two years ago.

In connection with the new national communications policy board, it is known that the top executive of the communications companies in the U.S. have written Dr. Stewart and the board members offering full cooperation in accordance with the terms of the President's executive order.

### Feathered Couriers

(Continued from page 29)

trained in as little as five days' time to home with messages from a distance of as much as 50 miles.

The expansion of the carrier pigeon program when the need arises will depend on the Department of the Army's affiliation plan by which national pigeon organizations not only supply birds but also pigeoneers, highly skilled in the training and handling of birds. During World War II about 40,000 of the 54,000 pigeons employed were supplied to the Signal Corps by American fanciers through voluntary donations. About half of the birds were returned to their owners after the war.

Pigeons are accountable property and are carried in the company property

record book. The accountability of young birds is not picked up until the first of the year following the completion of training and racing and after final selections have been made. The records of birds, including all flights, are kept from birth in a form similar to a soldier's 201 file.

All Signal Corps pigeons wear two identification leg bands. Each band carries the two last digits of the calendar year in which the bird was hatched and the pigeon's serial number. One band is marked USA, the other US. In case of disposal through sale, the USA band is removed, indicating that the pigeon is no longer Army property.

Probably no natural phenomenon has intrigued man and held his interest more than the ability of the homing pigeon to fly long distances from a strange locality and across unfamiliar territory to his home loft. The pigeon's ability has long been recognized and employed and the principles of training known. The Greeks transmitted the names of Olympic victors by pigeons, and historians believe they learned the art of training the birds from the Persians. The reason for the pigeon's ability to home has remained unsolved.

Evidence directed toward the solution of the age-old mystery of how the birds navigate was recently revealed in a report of experiments conducted over a period of six years by Dr. Henry L. Yeagley of the Department of Physics, Pennsylvania State College, in cooperation with the Signal Corps. Dr. Yeagley is of the opinion that the homing pigeon navigates to its home loft because of sensitivity to the magnetic field of the earth and to the coriolis forces. This latter results from a natural relationship between the earth's rotational velocity and motion of a body over the earth. The forces involved are a direct function of the earth's rotational speed, the speed of a body moving over the earth's surface and the latitude of the moving body.

A bird is sensitive to the magnitude of the coriolis effect by virtue of some organ or organs, Dr. Yeagley reports. The pigeon orients itself by becoming familiar with its home or loft, after which it is able to navigate or return to the home loft from great distances, even though it is not familiar with the intervening territory.

Studies at the New Jersey Agricultural Experiment Station at Rutgers University have disclosed that diet has considerable effect on the homing performance of pigeons. In another investigation conducted at Fort Sam Houston, Texas, in collaboration with the United States Air Force, pigeons were placed in a decompression chamber to find out how the birds would react when released at an altitude of 25,000 feet. Although experienced racers, the birds appeared confused and reluctant to fly. These tests indicate that, if air facilities are used, it may be necessary to give birds a rest of two or three hours before their release

in order to allow the oxygen content of the blood to become normal.

Other migratory birds have the power to navigate and in a great number of instances outperform the pigeon. One species, the golden plover, performs the feat of flying 3000 miles from Alaska to the Hawaiian Islands over the Pacific. These birds, however, have not been trained to serve man.

The Signal Corps pigeon is outstanding for its consistency of performance, which is all the more astonishing considering the bird's natural fear of gunfire. Big Tom furnished an example of such performance in World War I. Released at Grandpre at 1435 one afternoon, this bird flew through intense machine-gun and artillery fire; yet 25 minutes later his important message was delivered at a village 24 miles away. One of the bird's legs had been shot away and a part of his breast ripped open by a machine-gun bullet which was still lodged there. The message tube, intact, was hanging by the ligaments of the torn leg.

One of the famed hero pigeons of our time was *Cher Ami*, who saved the "Lost Battalion" of the 77th Division in World War I. Despite grievous wounds she flew 24 miles in 25 minutes, staying alive only a short time after her brave and historic flight. Her body was mounted and placed in the National Museum at Washington.

But the grand old man on the retired list at Fort Monmouth was Kaiser, who died 31 October 1949 at the age of 32 years, the age equivalent of 160 years in a human being. His body is now preserved in the Smithsonian Institution. Hatched in Germany on 27 February 1917, Kaiser was taken prisoner in World War I by United States forces during the Meuse-Argonne offensive. When in 1949 Kaiser slumped to the bottom of his cage at Fort Monmouth he still wore the aluminum leg band with the seal of the German imperial crown. Kaiser sired 103 offspring and, although he did not take part in World War II, a great number of his offspring did. In 1948 he traveled to Washington for an Army citation and received a gold leg band from a Los Angeles American Legion Post of which he was named an honorary member.

### Signal Corps Research

(Continued from page 19)

rated in field kits are being developed. To obtain a more basic solution to the entire subject of field photography, work is underway within the Signal Corps Laboratories and with outside contractors to perfect and adopt the "Land" process which gives almost instantaneous prints.

Another promising process known as "Xerography" or electrostatic photography is being constantly improved and has now reached a stage where reasonably good continuous tone prints



can be obtained. Putting it simply, the "Xerography" method utilizes in place of an ordinary negative, a metal plate with a coating which changes its electrical conductivity when exposed to light. This plate is given a static electrical charge prior to placing in the camera, then the picture snapped in the ordinary manner. The light admitted through the lens causes the charge to leak off the plate in proportion to the light admitted, leaving, in effect, a picture painted by electrons. By use of a fixing powder the picture can be fixed on the plate, then by a quite simple process transferred to paper. It is expected that for military use the end item will be a self-contained camera-developer which will turn out finished prints in 45 seconds.

Motion picture projectors for training purposes and for field entertainment also fall within the Signal Corps field of responsibility. Many of you probably remember, without much pleasure, the poor sound performance and the excessive breakdowns of the standard World War II projection equipment. Its replacement, a 16 mm sound projector, due to be placed in production within a few months, has picture and sound quality equivalent to that of a good 35 mm system in your local theater. Due to the rugged construction, use of component assembly techniques, and packaging for field use, maintenance problems are expected to be minor.

## DRY BATTERIES

The use of dry batteries in the services dictates that they be capable of storage, distribution and operation over a wide variety of climatic and handling conditions and that they have high capacities and long shelf life. Consequently, the military requirements have deviated so far from the conventional commercial product that in general the services can no longer depend on commercial developments to meet their needs.

Since the battery industry has few, if any, comparable commercial requirements, the taxpayer, through the services, must support the research and development needed to produce militarily usable batteries. The results in this field are ones which the Signal Corps and the taxpayer has a good cause to view with considerable satisfaction. Battery capacity which cost 25 million dollars in 1943, can now, as a result of Signal Corps research and development program, be produced for 8 million dollars.

Over the past seven years a total of some 57 million dollars have been saved in yearly dry battery procurement for the Armed Forces at a cost of less than 4 percent of the savings. Today, experimental data from the current battery program indicates that the battery cost will be halved again within the next 3 to 5 years.

Of equal importance are other advantages not measurable in dollars and cents but which are of importance

from the military and national point of view. The improvement of battery capacity and the development of miniature high power batteries has made possible the design of miniature battery powered electronic equipment. The magnesium cased battery which is nearing its final stages of development, eliminates requirements for enormous quantities of zinc, a critical material in wartime. The development of improved battery components such as carbon black, manganese dioxide, etc., from domestic sources has relieved our dependence on foreign sources which would probably be cut off in an emergency; and the overall improvement in battery performance has made possible the use of batteries in certain applications heretofore impossible.

The possibilities for further improvements in batteries are by no means exhausted either theoretically or practically. If adequate sources of synthetic manganese dioxide can be developed, a 100 to 200 percent increase in capacity over that presently being obtained, can be achieved at an increase in cost per battery of only 10 percent. Capacity of experimental magnesium cells has far exceeded that of similar sized zinc cells. Shelf life has almost reached the two-year mark and indications are that the desired 3 year life will be reached in the near future.

Much remains to be done to obtain a battery system suitable for very low temperatures. About the best accomplished yet for medium discharge rates is a cell which at minus 65° F will give about 15 percent of its 70° F capacity. However, a low rate bias cell usable from -100° F to +100° F is now in the pilot plant stage. Recent and current work on the alkaline dry cell system directed toward improving cell structure and reducing leakage will probably result in production of improved versions of certain standard size cells in 1950. While all problems of leakage and shelf life on this cell have not been solved, the system appears to be the most promising one in sight for use in miniature high rate batteries for miniaturized signal and electronic equipment.

The standards of performance built into U.S. military dry cell batteries are such that they are today the best produced in the world. The techniques of fabrication, the method of standardization and the formulation of the specifications under which such batteries are being procured are being reviewed by the Canadian and British services as a pattern on which their research and development and procurement will be based.

## COMPONENTS AND MATERIALS

The Signal Corps program on components covers such a wide variety of items and the results of past and present programs and the expected results of the future are so numerous and diversified as to preclude discussion in detail. The history of military walkie-talkie sets aptly illustrates the end re-

sult of one phase of the program—miniaturization.

The earliest walkie-talkie was the prewar SCR-194, a super-regenerative transceiver employing only two tubes and occupying some 650 cubic inches of space exclusive of batteries. Its wartime replacement, the SCR-300, was an FM transceiver employing 18 tubes and occupying 575 cubic inches. The postwar set which will go into production this year is a 16 tube FM set occupying about 200 cubic inches.

The terrific advance of employing 8 times as many tubes with the associated more complex circuitry into less than one third the space has been made possible by extensive research and development on tubes, components and materials and the end is not yet in sight. Further miniaturization in components, improvement in printed circuit techniques, increased use of such elements as the transistor and solution of the heat dissipation problem point toward further substantial reduction of size of end items.

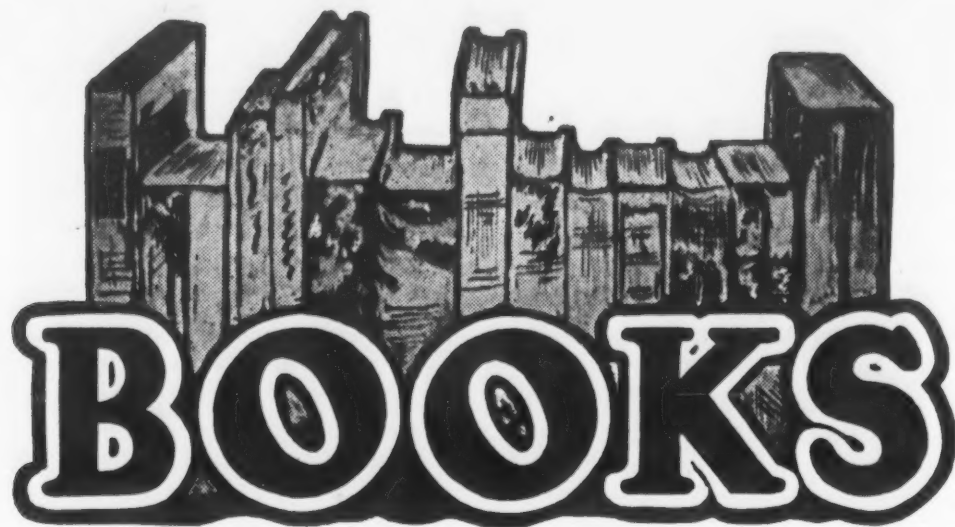
Constant emphasis on improving the reliability of components through application of the results of research and development and through extensive qualification testing of components used in military equipment should insure substantial reduction of the component failures incurred in the past war. Further, the work of the Armed Services Electro Standards Agency in standardizing components between the three services and accomplishing substantial reductions in the number of different components used will go far toward reducing the problems of component production in both peace and war.

Primary objectives of the materials program include improving the quality and reducing size and weight of Signal equipment; developing new materials; and conserving or substituting for critical materials. Typical results are improved magnetic materials; plastics suitable for insulating field wire; mica synthesis which has reached the pilot plant stage; quartz synthesis which will be in pilot plant production in the near future; vitreous enamel capacitors now in pilot plant phase; and glass dielectric capacitors which are ready for pilot plant production. The latter two are important improvements on, and substitutions for, the mica capacitor.

## CONCLUSION

The story of research and development in the Signal Corps is an interesting—almost romantic one—which cannot in an unclassified thumbnail sketch be presented in the full glory which the subject justifies. Those of us who live with it at all levels day by day believe that the Signal Corps research and development effort is the heart of the Army Signal Communication System, the heart of national security, and that a dollar wisely spent in military research produces far more for national security than ten dollars spent in any other way.





# BOOKS

## AND SERVICES

R. L. O'CONNOR, Secretary

**I WAS THERE.** By Fleet Admiral William D. Leahy. 527 pages. Wittlesey House. \$5.

One more in the flood of wartime memoirs, Admiral Leahy's book, an expansion of well kept daily notes during his service as Chief of Staff to the President, covers much of the same ground that has been covered by others who were close to the two wartime Presidents. But there are periods and incidents described, in which Leahy "was there," which make the book a worthwhile addition to one's war history collection.

Notable in the new historical source material presented is the account, with which the book opens, of the troublesome two year period when Leahy was ambassador to Vichy, France. The last months, especially tense, were aptly described in a letter from President Roosevelt to Ambassador Leahy—"you certainly have been going through a life that has aspects akin to punching bags, roller coasters, mules, pirates, and general hell during these past months."

Material also presented in Leahy's book which is not found in other memoirs, since other Presidential aides were not present, is the account of the Honolulu conference in 1944 when President Roosevelt met with MacArthur and Nimitz.

Of interest is Leahy's attitude toward the atom bomb. Thoroughly opposed to its use, the admiral considers it a barbaric weapon. However, he concludes, "Until the United Nations, or some world organization, can guarantee—and have the power to enforce that guarantee—that the world will be spared the terrors of atomic warfare, the United States must have more and better atom bombs than any potential enemy."

**FASCIMILE.** By Charles R. Jones. Murray Hill Books, Inc. 422 pages. \$6.

Mr. Jones' book, not to be confused with others of the same title, is highly recommended for anyone interested in facsimile communication—a medium destined for development and improvement which will put it to wide various use by the general populace.

The author describes all of the leading manufacturers' products in this field in thorough detail and with ample illustrations. In fact, all present day instruments are described, as well as experimental devices not yet in general use. There are detailed service notes covering all leading equipment.

The book begins with a history of facsimile covering the earliest records, progressing up to the present—an interesting coverage which should be engrossing even to the layman.

**THE RADIO AMATEUR'S HANDBOOK,** 27th Edition, 1950. By the headquarters staff of the American Radio Relay League. 615 pages. \$2.00.

The Handbook, covering the entire field of "ham" radio communication from fundamentals to the latest techniques in single-sideband telephony, reflects in the current edition the changes that have taken place in the technical practices of amateur radio during the past year. A new problem, television reception interference, is treated extensively.

**RADAR SYSTEMS AND COMPONENTS.** By Bell Laboratories Staff. D. Van Nostrand Company, Inc. 1042 pages.

The responsibility for the bulk of research and development in the sudden wartime work on radar was shared by the Bell Laboratories and the radia-

tion laboratory at M.I.T. About one-half of the Bell Labs' entire wartime effort was devoted to radar.

After the war it was felt that the striking advances achieved, especially in the field of radar, should be recorded in detail so far as security considerations would permit. This volume is the result of that recording, the papers making up the book having originally appeared in the Bell System Technical Journal.

**MODERN OSCILLISCOPES AND THEIR USES.** By Jacob H. Ruiter, Jr. Murray Hill Books, Inc.

This book is written for the electronics student and for the radio technicians and repairmen who have a background in general physics. The explanations have been written with these types of readers in mind, and the learn-by-doing method of instruction has been employed to teach specific operations.

Starting with a discussion of what the oscilloscope is, what it consists of, and examples of the various functions it performs, the book progresses logically to the operation of the cathode-ray tube which is the indicating device employed in the oscilloscope. Then the operation of the oscilloscope is explained with detailed information on each element.

Throughout, the book presents the most useful information in a clear manner that can be readily understood by anyone who has had elementary electronics training.

A section is also included on photographing cathode ray patterns.

**ARRL AMATEUR RADIO MAP OF THE WORLD.** Published by The American Radio Relay League. 30" by 40" in four colors, on heavy map paper, revised postwar edition. \$2.

The new and completely revised edition of the ARRL's Radio Map, a special projection by Rand McNally, has been especially prepared for use by amateur radio stations primarily in their "DX" or long-distance communication activities, and is completely different from any other map now on the market.

**AN INTRODUCTION TO COLOR.** By Ralph M. Evans, Color Control Department Head, Eastman Kodak Co. 340 pages. \$6.00.

Mr. Evans analyzes color in terms of its most important aspects, the physical, the psychophysical, and the psychological. No extensive knowledge of physics or psychology beyond basic principles is necessary for use of the book.



**LETTERS FROM LORD NELSON.**  
*Compiled by Geoffrey Rawson.*  
*Staples Press, Inc. 456 pages.*

This collection of Nelson's letters gives a complete and accurate survey of the great seafighter's life and activities as he saw and described them in his own words.

Spanning his life from his first command to his last, the letters cover every aspect of his life whether domestic professional, political or strategic, and include many of his official despatches. They are addressed to hundreds of people, ranging from monarchs and princes, to his wife, his relatives, his friends, and his brother officers.

The great courage of the man is notably marked in his attitude, as expressed in his letters, following the loss of his arm, and in the determination with which he set about learning to write with his other hand. The first of these lefthand written letters is also included in the compilation.

**TECHNIQUE OF RADIO DESIGN.** By *E. E. Zepler.* John Wiley & Sons, Inc. 394 pages. \$5.00.

The aim of this book is to provide a quick grasp of essential facts and a development of common sense in foreseeing and avoiding complications in design. In accord with this, practical application of principles has been kept foremost. This second edition provides a more detailed discussion of fundamentals in addition to a lengthier treatment of receiver noise and negative feedback.

Contents: Some fundamental theoretical facts; Transfer of energy from the

aerial; The amplifier stage; Problems of detection and frequency changing; Selectivity; Receiver noise; Gain control; The principles of screening; Undesired feedback; Hum; Spurious beats; Distortion; Parasitic resonances; Power supply; Routine measurements.

**RADIO ENGINEERING.** By *E. K. Sandeman.* John Wiley & Sons, Inc. 775 pages. \$6.50.

This book is designed to give beginners in radio the working principles in the shortest possible time. Information is given in a logical order. A working knowledge of elementary algebra and

logarithms is sufficient for understanding the subject matter.

Contents: How broadcasting is done; Electrical effects and units; The Sine wave and vectors; Relations between steady voltages and direct current; Relations between alternating voltages and currents; Selective circuits; Resonance and tuning; Power in alternating current circuits; Harmonic analysis and distortion; Thermionic tubes; Amplifiers; Oscillators; Drive equipment; Modulators and modulation; Transmitter types; Operation and maintenance of transmitters; Feeders; Aerial coupling; Circuits and aerials.

## National Best Sellers

*Compiled on a Percentage Basis from the Reports of 65 Booksellers as Listed in Publishers' Weekly for March 18*

### Fiction

1. **THE PARASITES**, by *Daphne Du Maurier.* \$3.
2. **THE EGYPTIAN**, by *Mika Waltheri.* \$3.75.
3. **THE KING'S CAVALIER**, by *Samuel Shellabarger.* \$3.
4. **GENTIAN HILL**, by *Elizabeth Goudge.* \$3.50.
5. **MARY**, by *Sholem Asch.* \$3.50.
6. **JUBILEE TRAIL**, by *Given Bristow.* \$3.
7. **ONE ON THE HOUSE**, by *Mary Lasswell.* \$2.50.
8. **A RAGE TO LIVE**, by *John O'Hara.* \$3.75.
9. **THE HORSE'S MOUTH**, by *Joyce Cary.* \$3.
10. **THE WAY WEST**, by *A. B. Guthrie, Jr.* \$3.50.

### Nonfiction

1. **THE MATURE MIND**, by *H. A. Overstreet.* \$2.95.
2. **WHITE COLLAR ZOO**, by *Clare Barnes, Jr.* \$1.
3. **HOME SWEET ZOO**, by *Clare Barnes, Jr.* \$1.
4. **THIS I REMEMBER**, by *Eleanor Roosevelt.* \$4.50.
5. **THE PEABODY SISTERS OF SALEM**, by *Louise Hall Tharp.* \$4.
6. **A GUIDE TO CONFIDENT LIVING**, by *Norman Vincent Peale.* \$2.75.
7. **THE ROAD AHEAD**, by *John T. Flynn.* \$2.50.
8. **AMERICAN FREEDOM AND CATHOLIC POWER**, by *Paul Blanshard.* \$3.50.
9. **THE AUTOBIOGRAPHY OF WILL ROGERS. \$3.**
10. **THE BABY. \$1.**

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## Cable Net, France

(Continued from page 9)

mans during the occupation, were put in service on various occasions where they were urgently needed and they proved to be of great assistance.

Factories were opened progressively, permitting material to be repaired, and the manufacture of certain equipment (motor-generator sets and rectifiers) to be completed. Manufacturing programs gotten under way that had been planned since the beginning of 1924 to offset the inevitable destruction to come.

Due to the devotion of the personnel and to the methodical organization of the work, the reconstruction of the network was extremely rapid. At the end of December 1944, or five months after the liberation of Paris, 89% of the circuits in service in 1939 had been reestablished, representing 61% of the circuit-miles in service before the war. (Figure 4).

### Reconstruction of the network:

In 1945, the management of the long distance lines launched its program of building reconstruction and the extension of its temporary repeater stations. Thanks to the efforts of the manufacturing people, whose plants had by then been put back in full operation, the long distance network equalled by 1945, or about a year after the liberation, the prewar network. By the end of the same year it had become even greater, the number of circuits having reached 118% and the circuit mileage 106% of the prewar values.

## Radio Studio, Military

(Continued from page 26)

a good deal easier by the presence of my assistant and chief supporter in moments of stress, Captain Kenneth B. Clark. Ken had the most fortuitous combination of traits a radio man could possess. He had the dash and decision characteristic of a fighter pilot, and the mature judgment of a seasoned showman, both of which he was. It was his flair for the dramatic at the mike and on the lecture platform that put into the radio instruction whatever color it had.

After two years at Craig Air Force Base, the Secretary of Defense directed that our public relations course, which was part of the Air Special Staff school, be merged with the Army Information School at Carlisle Barracks, Pennsylvania. The new institution was to be known as the Armed Forces Information School. So we again packed up the gear and headed for the old Indian-school town of Carlisle. Once arrived, I found a pleasant surprise. The studio was there, it turned out, by specific written authority of the Secretary of Defense. After four years of precarious existence on word-of-mouth authority, we were legal at last.

We also heard some other news when

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<i>(no agency)</i>	
<b>Western Electric Company</b> .....	<b>47</b>
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we arrived. Instead of building the studio leisurely as we had been expecting to do, we were going to have to build it right away, in order to have it ready for the first class under the merger. Ordinarily this would have posed no great problem. However, as usual, I was the radio instructor as well as the studio builder and there was the little matter in instructional material to prepare and deliver while putting the studio together. It was inevitable that both the studio construction and the student instruction suffered somewhat from my dual role. They would have fared worse had it not been for Lt. Bill Bannister, who had been radio instructor at Carlisle prior to the merger and who shouldered many of the instructional and administrative details during the first semester under the merger.

The Armed Forces Information School here consists of two principal parts—the Department of Information and Education and the Department of Public Information, under which is the radio-television section which operates the studio. The purpose of the section is to teach commissioned and enlisted students the use of radio as a public information medium. Other sections of the department teach the use of press, photography, public speaking, etc. for the same purpose.

About a year ago, Lt. Commander John E. (Barry) Bauernschmidt, former CBS director and Navy advisor on motion pictures, became head of the radio-television section. Our other instructor in the section, Lt. John Hollowell, USAF, joined us about the same time and is the school's specialist in television. I'm assistant to the com-

mander and also technical officer in charge of the studio.

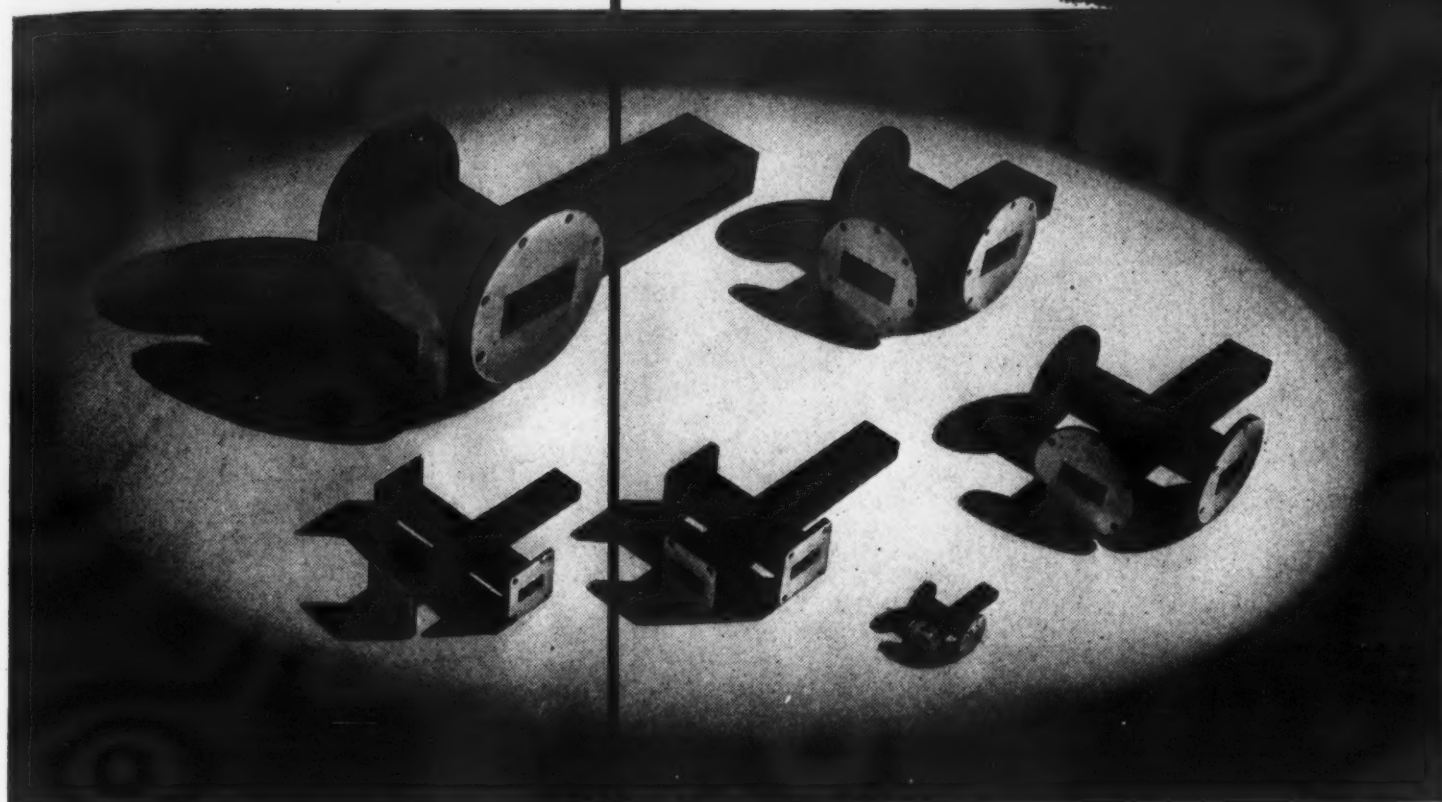
The studio is strictly an audio facility, television being taught at present by motion pictures, lectures, and by analysis of kinescope prints. The equipment compares favorably with network installations—Hammond organ, sound effects and music library, adjustable echo and filter, control console, tape, wire and disc recorders; remote equipment, and complete set of test gear. Almost fifty feet long and twenty feet wide, the studio seats up to sixty persons as observers and accommodates casts numbering up to fourteen students whose shows are recorded and played back to them for criticism. The control room, like the studio, is spacious and accommodates thirty observers who hear their fellow students' shows over the monitor speaker and watch the work of the engineer and director seated in front of them.

From our first crude studio at Mobile to our present professional installation here at Carlisle Barracks is a long way in time, space, and status. The translation of what was a bare idea into a substantial and recognized audio facility required a tremendous amount of work and imagination on the part of the many persons associated with this activity over the past six years. As the officer in charge during that time, I don't begrudge the pioneer work—the improvising and the contriving—that went into it. On the other hand, four studios in six years is a lot of studios and I wouldn't want to do it all over again—that is, not in my calmer moments. The only trouble is, there are no calm moments in the broadcast game.



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233	4.0-6.0	24	RG-49/U	2x1x.064	UG-149A/U
321	4.0-6.0	30			
322	4.0-6.0	40			
209	5.3-8.1	24	RG-50/U	1½x¾x.064	UG-344/U
237	5.3-8.1	30			
235	8.1-12.4	20	RG-52/U	1x½x.050	UG-39/U
236	8.1-12.4	24			
234	8.1-12.4	40			
388	12.4-17.0	20	RG-91/U	.702x.391x.040	UG-419/U
413	18.0-26.5	20	RG-53/U	½x¼x.040	UG-425/U
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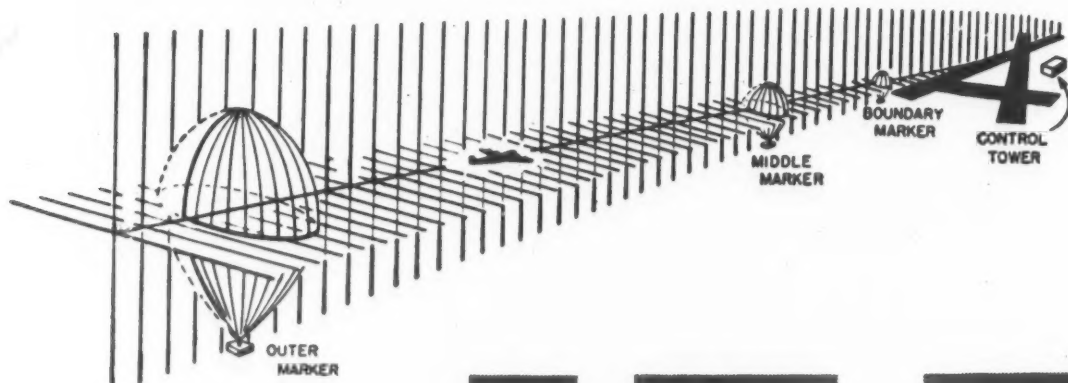


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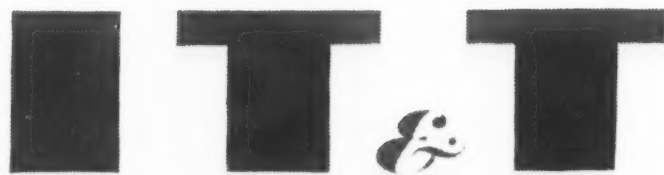


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